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POPULAR COMPUTING WEEKLY

A FOCUS MAGAZINES PUBLICATION

June 30–July 6 1988 70p

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☐ We report from the PC User Show, with news of all the latest developments

Government neglect "effectively blocking" personal data access

BRITISH citizens wanting access to files held on computer databases are being hampered by high access charges and the Government sparse awareness advertising, according to London Labour MPs Chris Smith and Harry Cohen.

Cohen charges that the Government is neglecting the Data Protection Act and is pressing for a Parliamentary adjournment debate to have it revised.

Smith, MP for Islington South, says that while the Government puts its spending priorities on privatisation and in promoting the new look DTI as the Department of Enterprise, informing people about their rights is, he alleges, a low priority.

Cohen told *Popular Computing Weekly*: "The spirit of the Data Protection Act holds that people should know what is being held on record about them. The high charges made for access to records are off-putting; at £10 a record it has been calculated that some people could spend as much as £800 just to look at all the records held on them by some Government departments. That is effectively blocking their access."

Such charges occur because any person is likely to have a computer record for every occasion they have registered with a department, such as the DHSS.

Smith told *Popular Computing Weekly*: "Most of the people who are taking advantage of the provisions of the Act are those working in Government depart-

continued on page 5 ▶

Parliament . . . adjournment debate requested.

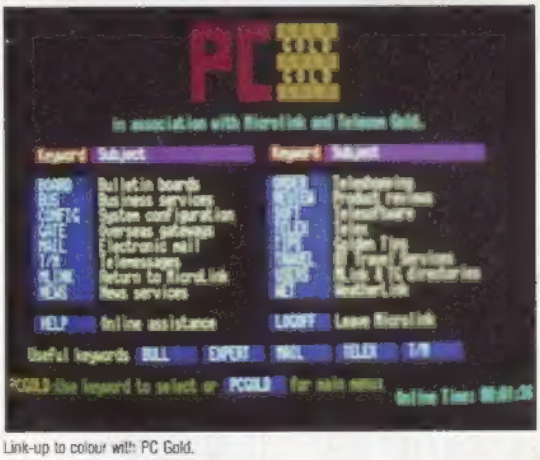
Colour facelift for MicroLink PC users

MICROLINK has revamped its Telecom Gold service to take advantage of the Prestel July price increase. With the increasing subscription charges, MicroLink is expecting a number of defections from Prestel and is to offer new facilities free for PC users.

A major change to the MicroLink user interface is the colour graphics, replacing the old black and white text. It will make MicroLink the first colour system on Telecom Gold.

New MicroLink facilities will include an on-line library containing reviews of PC hardware and software releases. PC Gold also features keyword searching, which means that someone keying-in will be presented immediately with a review of the package.

The Telex service has also been re-designed and simplified so that users can call up on-screen help from a clearly-laid-out Telex form. This can be transmitted to the Telex network by a single key-stroke. PC users can access the new facilities through a re-designed menu.



Link-up to colour with PC Gold.

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EDITORIAL

OUR cover story highlights the fact that revision of the Data Protection Act is essential if the Government is to embrace a semblance of the spirit in which it was drawn up.

That spirit holds that we should all have the right to see and correct our personal data. That can be done only when the population is, (a), made aware of its rights and, (b), has access costs lowered to a reasonable level or removed entirely.

An ironic footnote to the DPA story, and one which shows the spirit is alive somewhere, is that we were unable to obtain names of Conservative MPs with an interest in the DPA.

The House of Commons information office told us that the only two MPs who had asked questions on the subject were the two Labour MPs mentioned in our story. When we asked the Office of the Data Protection Registrar for names of interested Tories, we were told that for reasons of data protection, no names could be given from the Office mailing list.

MEANWHILE, at our offices elsewhere in Westminster, we have received a vitriolic defence of Trilogic's controversial C-64 Expert Cartridge. This device allows disc-to-tape and tape-to-disc copying, monitors program disassembly and simplifies program routine handling.

Trilogic is up in arms because it claims that the same games software houses which use it as a programming aid are criticising the system publicly as an encouragement to piracy. Surely a point is being missed here.

The very nature of software makes it more prone to piracy than almost any other product. Any device which aids programming is in some sense bound to help the pirate "programmer", especially when it can perform copying.

If software houses are operating the double standards alleged by Trilogic, they should perhaps be looking at other copy protection methodologies, like code wheels or, as Trilogic suggests, look into bringing the disc prices more into line with those of cassettes.

Paul Marks

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U.S. Government under pressure from irate computer makers

By Nick Masters

ATARI and Apple are involved in a new move aimed at scrapping the cause of the current chip shortage. At the centre of the controversy is the U.S. Government Department of Commerce fair market value legislation which sets a minimum sale price for Japansese chips.

The consortium of electronics manufacturers, which also includes Compaq, Tandem and Tektronix, has asked U.S. Commerce secretary William Verity to cancel the policy and restore free market competition, which it hopes will stabilise prices and availability according to demand.

The legislation was introduced originally to try to prevent Japanese memory manufacturers selling their chips in the States at 'below market' prices. Their response was to increase prices and limit the numbers available.

Many other large U.S. firms disagree with the new move, believing an end to the FMV will result in a return to such 'dumping' activities. Instead, they argue, it should be modified to prevent the Japanese keeping prices artificially high and prolonging the shortage.

Already Amstrad and Atari have been compelled to increase prices because of this multi-national fall-out and it is widely expected that unless the deadlock is broken soon others will be forced to follow.

New high-tech scoreboard at Lord's.

Lord's bowled over by an Amstrad driven scoreboard

AN Amstrad PC1640 is the power behind the new electronic scoreboard at Lord's cricket ground. The £250,000 board, produced by Varitext Displays, is unusual in that it uses 14,400 discs instead of electric light bulbs.

The discs are controlled individually by the Amstrad and are black on one side and white on the other.

As each run is entered into the computer, a 12-volt pulse is fed to electromagnets behind the discs, thus turning them to display the score.

Any configuration can be digitised on to the computer and displayed.

That means the board can produce pictures, sponsorship logos, advertisements and public information. The board can also provide moving pictures.

Two PCs are used for each board. One runs the board while the other is used as a stand-by, allowing the operator to work on graphics or to key-in other information. A similar board will be installed at Wimbledon greyhound track later in the year. It will be interfaced with the tote computer.

Blast from the past with first Mirrorsoft coin-op

MIRRORSOFT has gained an exclusive licence for its first coin-op conversion, *Blasteroids*, in a cross-licensing deal with Atari Games and its subsidiary Tengen.

Under the terms of the agreement, Mirrorsoft has granted Atari Games a licence to convert the Soviet game *Tetris* to the Nintendo games console, a machine which is very popular in the United States. Tetris has already sold well on the C64 and PC in the U.S. and Mirrorsoft claims that competition for the Nintendo licence was "fierce".

Mirrorsoft will convert Blasteroids to all formats and sell it in Western Europe and Australasia.

Commenting on why Mirrorsoft has waited until now to enter the coin-op conversion market, managing director Peter Bilotta says: "We were waiting for an exciting and playable game; now we are certain we have a classic product on our hands."

Mirrorsoft will be launching five new games in July.

Labyrinth in a post box

ANOTHER *Play by Mail* game has been launched by Standard Games. In *Dark Blades* you need to have a shrewd mind to get anywhere. The game is not related to any computer, so anyone can play. The initial cost of joining is £5. For that you get a detailed A2-size colour map, rule book, registration form and two free turns. Subsequent turns cost £1.25 each but can contain many complex commands. All this is neatly packed in a colourful box.

There are two races on the island of Labrynthia, where the game is located. They are the Mon Ogres and the Humans. Both races have been at each other's throats for many years. Each does devilish deeds to the other, often resulting in war. Each race has two types of character. Tradera and Warriors, and every person playing the game has his own characteristics, so no two people are exactly the same. It is predicted that an average game could take up to two years to complete, sufficient to keep the most ardent adventurer busy.

Standard Games can be contacted at Dark Blades, Standard Games PBM, Arlon House, Station Road, King's Langley, Herts WD4 8LF.

Promotion starts in mid-July.

Sticky cover-up

DISTRIBUTOR Microdealer has launched a software version of a Green Shield Stamps promotion, in which sticky-back tokens will gradually qualify the buyer for a free gift from a catalogue. Called the Great Microdealer Cover Up, the promotion starts in mid-July.

In addition, Microdealer is claiming to be the first games software house to take advantage of the T-shirt mania which afflicts many at exhibitions. Instead of a once-a-year T-shirt blitz, Microdealer will stock dealers with its T-shirts all year round.

386 moves downmarket

PRICES are reduced on existing models of the Compaq Deskpro 286, 386 and 386/20. Prices will be reduced by up to 18 percent, taking a typical 16MHz 40MB system down from £4,195 to £3,195.

NEC cut £700 from the price of its 40MB 80386 machine to £3,995.

Compaq also extended its family of 80386-based PCs with the launch of the Compaq Deskpro 386/25 and the 386s.

The 386/25 - priced at £5,595 - combines the new 25MHz Intel 386 processor with Compaq Flex Architecture.

This makes use of the 25MHz Intel 82385 cache controller and the new system runs up to 60 percent faster than non-cache-based systems.

Joe McNally, U.K. managing director of Compaq, pictured with the 386/25 and the 386s.

It can also be equipped with up to 1.2 gigabytes of fixed disc drive storage when combined with two of the new fixed disc drive expansion units.

The 386s is the first PC to use the new Intel 386SX microprocessor - see In Brief, June 23 issue. The new system is capable of 35 to 60 percent better systems performance compared to 10MHz 80286-based PCs. Peter Bayley, Compaq marketing director, does not see the launch and price reductions as directly related, and attributed the cuts to a "constant campaign to reduce manufacturing costs."

Accelerator pre-empts faster Amstrad PCs

WHILE speculation still rages over whether Amstrad will launch an 80286- or 80386-based machine this year, an 80286 accelerator card for the PC1512 and 1640 has been announced by London-based Ideal Hardware.

"Even if Amstrad produces a 286 machine, we will still be creating an upgrade path for the existing user base," says James Wickes, managing director of Ideal Hardware.

Running in any IBM PC clone with an 8086 host processor, the ATD 286 board will be available in August priced at £349. A version is also planned for 8088-based PCs and clones.

Applications for the accelerator board are expected to reside mainly in desk-top publishing, where Wickes says PC users are running out of processing power.

The half-card-sized device slots directly into the bus of Amstrad 1512 and 1640 microcomputers. Features include 8KB of zero wait-state cache memory, which the user can switch in or out from the keyboard. The ATD is also switchable between 8MHz and 12MHz clock speeds and supports the Intel 80287 maths co-processor.

Distribution negotiations are in hand with Amstrad dealers according to Wickes.

Amiga flying high on Interceptor

THE Amiga share of the games software market has reached its highest-ever level. According to the latest Gallup report for early June, Amiga software has a 2.5 percent share. With the ST share dipping from 6.2 to five percent, the 16-bit formats now occupy 10 percent of the market.

According to Matt Browne, software researcher for Gallup, the decline in the ST share can only be attributed to "weekly fluctuations" and is not necessarily a continuing trend.

Fuelling the present rise in Amiga sales is Electronic Arts *Interceptor*, which rocketed to number 12 in the Gallup early June Top 50. This title is available only on Amiga and puts the user in command of either an F-18 or an F-16 Hornet in a very realistic simulation.

Mark Lewis, managing director of Electronic Arts, comments: "Obviously there are many Amiga owners waiting for software which 'fulfils the promise' of their machine".

◀ continued from cover

ments, most noticeably the Ministry of Defence". Cohen believes this is because civil servants are "trying to find out why their promotion is being stymied."

Nigel Waters of the Data Protection Registry concurred with Cohen and Smith; 4,000 public access requests were received from MoD employees against "a few hundred" from other departments.

Waters says that £300,000 has been spent on two information campaigns, which ran in November, 1987 and March this year. Some 30,000 requests for information on the Act were received.

Various complaints about the nature of the data found to be on file arrive at a rate of about 30 per week.

They cover a range of abuses, from plain inaccuracy to charges of unfairly obtained data.

IN BRIEF

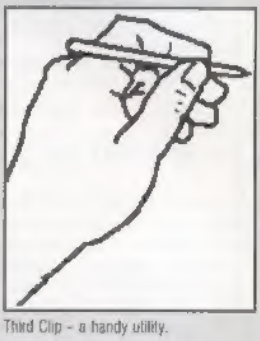
Sink the image

GREMLIN Graphics is hoping to ditch what it calls its "cutie" Monty Mole image with the launch of *Night Raider*, a World War II action simulation. Running on all formats, the package puts the user in the pilot's seat of a dive bomber stalking the Third Reich battleship *Bismarck*. A full review will appear next week.

ST clipped

DESK-TOP publishing programs running on the ST can now import a variety of standard copyright-free graphics using *Third Clip*, a graphics library from the curiously named Moving Finger Co.

Third Clip comprises 20 full screens of artwork on two discs which retail at £24.95 for the pair. Details on 0703 229041.



Third Clip - a handy utility.

Six for summer

AMIGA software house Micro-Illusions is releasing six new games titles during the summer. There is a June release for *Ebonstar* (£24.99), an adventure game for up to four players.

In July, the charmingly-named *Craps Academy* (£24.99) will allow five players to learn the American card game. *Land of Legends* (£29.99) will be the first in a series of dungeon-type adventures, while *Turbo* (£19.99) is a road war shoot-'em-up. In *Tracers* (£24.99) you team with Integrated Human Operations Police to tackle thieves, thugs and terrorists. Due for release in August is *Planetarium*, an astronomy program priced at £39.99.

LETTERS

Had it good all along

I note with interest the Shock Horror reaction of Micronet members to the recently-announced off-peak connect charges and increased subscription. As they all prepare to leave in disgust and in the hope that it will change the minds of the powers that be, let me put to them a point which may not yet have sunk home.

Outside the subsidised, closeted world of Micronet, people have been paying for services for a long time. I have subscriptions to various networks, here and in other countries, and none of them is able to offer service for the price Micronet used to offer. They will not change their minds because in reality all they are doing is bringing up their prices to a more realistic level.

Once those ex-Micronetters start to look for alternatives they will find that the truth is they have been having it very good for many years. So far as I can see the only service at the moment which offers anything close to the price deal to which they are accustomed is Compunet which can expect large numbers of new subscribers in the near future.

W. M. Barry,
Bolton,
Gtr. Manchester.

Up-to-date guy

I am advancing in years and in an attempt to keep up-to-date with new technology I am considering purchasing a computer. To pursue this aim I intend to buy a home micro and learn how to program it.

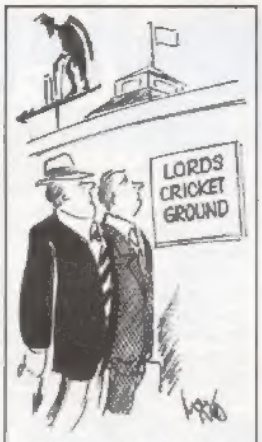
In a conversation with my grandson I have come to the conclusion that Basic would be the best language for me to learn. I am considering the possibility of purchasing a Vic-20 from one of my grandson's friends; could you recommend this machine for learning Basic.

A. Manner,
Plymouth.

I am heartened to hear that you are not falling behind the times but I would not recommend a Vic-20 for the purpose of learning Basic.

The problem with the VIC is Commodore Basic which lacks many of the features to allow structured programming.

For a more flexible approach you should consider the purchase of an Amiga or an Atari ST, both of which allow you to select a Basic to suit your needs.



"It was the middle order batting and the scoreboard software that let us down in the second test."

Treading a tight rope

I have programmed a number of games in last four years on the Amstrad 6128 and recently on the Tandy 1000 - IBM type. It was not until the last two years that any of my games have been good enough to publish.

Although I have made many games they all have been for my own use. When I bought the Tandy I had to make my own games or die from lack of IBM arcade games. So, being an arcade addict, I started on a conversion of *Hypersports*. It was soon completed and I soon found that I could convert many of my favourite games.

Only six months after that I had programmed five games - *Hypersport, Out Run, Space Harrier* - not completed - Section 2 and a very dodgy version of *Afterburner*.

Now that I have these games and want to make some money from them, would it be possible to have them published? Or could I sell each game through well placed advertisements. This applies mainly to Space Harrier, as it has 16/32 colour sprites, the waving bloke on the robot and 22 levels of play, all on a full-size screen. Need I say more?

J. Ledger,
Hampshire.

The "waving bloke on the robot" sounds fun but converting and selling commercial software is illegal. The copyright is part of the game licence. U.S. Gold licences Out Run from Sega and has sole rights to the game. If you are intent on selling your conversions your best bet would be to contact the original software houses to discuss the situation.

Spaced out

Looking at advertising in *Popular Computing Weekly*, I think you should use more space to provide readers with an up-to-date and detailed analysis of the computer market.

Second, I feel it should contain topical and interesting reviews and features on new releases and upgrades about to be released.

I am pleased to see that some of the original favourites still survive, like Bytes and Pieces and Kenn Garroch, but I would like to see more of the above-mentioned articles. After all, I would imagine that very few readers buy *Popular Computing Weekly* purely on the strength of its advertisements.

K. August,
Southend.

***Popular Computing Weekly* maintains a healthy balance in respect of the editorial to advertising ratio. Our classified section is the largest in the industry and many readers find those and the display advertisements informative - especially on current pricing.**

Spectrum ignored? - another +3 program

With regard to the letter from P. T. Street of Sidmouth, I share his sentiments on the apparent ignoring of the Spectrum +3 by software houses. As an owner of a +3 I can say I believe that it is a very good machine and good value, especially as it can be obtained for £160 by shopping around.

Unfortunately, I believe that the introduction of the +3 was too late, as it now has to compete with the ST and Atari machines. If only the +3 had been introduced instead of, and at the time of, the Microdrive.

In answer to the plea for more +3 utility programs, may I invite Street, and other readers, to send me a stamped addressed envelope for details of *Flexipage 200*? Available on +3 disc, Opus Discovery disc, Microdrive and tape, this combined 48K/128K authoring system produces a viewdata-type large text and graphic display of up to 200 half-page or 100 full-page displays on a 48K Spectrum and uses the extra memory of 128K computers to interchange programs, data and variable user-defined graphics between ram disc, disc and cassette.

Filmed recently in action and transmitted by Harlech Television on a schools programme Dial 999, the program will run in three modes - automatic for continuous displays, interactive for exercises or adventure games, and free-format for group exercises.

As supplied to nine police forces to date, the program is delivered, in the interests of crime prevention, with a ready-to-use set of interactive exercises. They have been designed for a cross-section of users, from children of five on the Stranger Danger theme, through Neighbourhood Watch-type adventures to house and car security tests and advice, and have been used with success at schools, fetes and youth groups.

David Wornham,
Droitwich,
Worcs.

Taking the good with the bad

I am 16. In the last few months there have been many letters printed which have continued the Amiga-ST debate; this is another. As an owner of the Amiga A500 I can easily see which is the better machine but having said that I am not about to criticise the ST. The Atari ST is a fine machine and deserves its place in computer history.

On the other side the Amiga is a better machine and I believe that anyone who says otherwise has not seen or at least used one in any form. Like anything in life they both have good and bad points but the fact remains that the Amiga is selling more and more every day and consequently the software gets better and better.

I think the only thing they have in common is both based round the Motorola 68000 processor. Apart from this factor they are completely different machines and it is not fair to compare them.

I am not going to resort to the my-computer-has-50-billion-colours-blah-blah-blah school of thinking as I feel that this kind of talk belongs in playschool with the four-year-olds. I can only say that I believe the Amiga is about to become the success it deserves to be and I am glad, as I was beginning to have my doubts. As an afterthought, it will be interesting to see what happens now that the ST and Amiga are the same price.

Ian Anderson,
Birstall,
Leicester.

MICRONET

Shades

MULTI-USER GAME

ACCESS TO A MODEM?

THEN DIAL DIRECT INTO THE ULTIMATE ADVENTURE

Without subscribing to Prestel or Micronet you can now dial direct into Shades through Derived Service Network (DSN). Even as one of the leading multi-user games, it has been one of the best kept secrets around. Accessible in either viewdata or scrolling modes, everyone with a micro and a modem will soon be pitting their wits in the land of Shades.

As players are free to roam anywhere, this enthralling game takes you on an adventure unlike any other. Real life choices and decisions to be made, as you meet fellow travellers and strange mystical beings en route.

Begin as a novice and work your way up to the all-powerful status of Wizard but beware there are those ready to trap you. So plan your strategy well – perhaps with others, at one of the Shades popular meeting places.

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★ 8 expansion slots (4 available)
★ 1 Serial port, 1 Parallel port
★ MS-DOS 3.1
★ Option of Mono green, Paper white, or Colour monitors (see Upgrades)

CODE	DESCRIPTION	R.R.P.
APA005	XEN FD – 2 x 720K 3·5" Drives	£1849.00
APA010	XEN HD – 1 x 720K 3·5" Drive and 1 x 20Mb Hard Disc	£2849.00

XEN UPGRADES

CODE	DESCRIPTION	R.R.P.
APAM05	12" Hi-res Mono Green Monitor	£249.00
APXM05	12" Mono Paper White Monitor	£349.00
APAM10	Mono Adaptor	£149.00
APAM20	Colour Adaptor	£299.00
APAJ10	5·25" External Floppy Drive	£299.00
APAJ20	20Mb Internal Hard Disc	£799.00
APXJ05	Network Board and Tap Box	£199.00
APXJ10	Internal Modem Card V2	£249.00
APXJ15	Mouse and Cable	£149.00
APXJ20	External 20Mb Tape Drive	£899.00
APXJ25	80287 Maths Co-processor	£299.00
APXJ30	XEN-Tel	£149.00
APXJ35	1Mb Ram Card	£599.00

LIST OF SOFTWARE AVAILABLE FOR THE XEN RANGE

AMSTRAD Tandon EPSON ZENITH

AVAILABLE – AUTHORISED DEALERS

apricot *XEN-i 386*

★ 80386 Processor at 8 and 16MHz clock speed
★ 1 or 2Mb on XEN-1 386/45 (both expandable to 16Mb)
★ 3 short expansion slots
★ Serial and Parallel ports
★ Choice of 3·5" 1·44Mb or 5·25" 1·2Mb Floppy Drives
★ IBM ATE keyboard
★ MS-DOS 3.2, MS Windows, VP Planner, GW Basic
★ Optional 3 length full expansion box
★ Option of green, paper white, or VGA compatible monitors

PRODUCT PRICES XEN-i UPGRADES

CODE	DESCRIPTION	R.R.P.
APIJ05	Microscreen Keyboard	£179.00
APIJ10	Above memory card + 512K	£349.00
APIJ11	512K AM Card expansion module	£149.00
APIJ20	1Mb memory module (XEN-1386/30)	£300.00
APIJ25	4Mb memory module	£1200.00
APXJ05	Network board and tap box	£199.00
APXJ10	Internal modem V2 (V21/23)	£249.00
APXJ20	External 20Mb Tape Drive	£599.00
APXJ25	80287 Maths co-processor	£299.00
APXJ30	XEN-TEL	£149.00
APIK30	80387 Maths co-processor	£499.00
APIJ35	XP-IBM compatible expansion box	£199.00
APIJ40	PX card convertor	£49.00
APIJ45	5·25" external floppy drive	£299.00
APIJ50	MS-DOS 3.3 manual	£49.00
APIJ55	Triple X Modem (V21/22/23)	£399.00

CAMBRIDGE COMPUTER

THE Z88

Z80 Processor
Short travel QWERTY keyboard
32K Ram (expandable to 416K)
32K Rom (expandable to 384K)
3 expansion slots for Rom or Ram cartridges
Uses standard AA batteries giving 20 hours active use
8 lines by 94 characters working display area
High quality supertwist Liquid Crystal Display
Wordprocessor, spreadsheet, BBC Basic, Diary, Clock, Calendar and Alarm software as standard
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A4 size – ¾ inch thick

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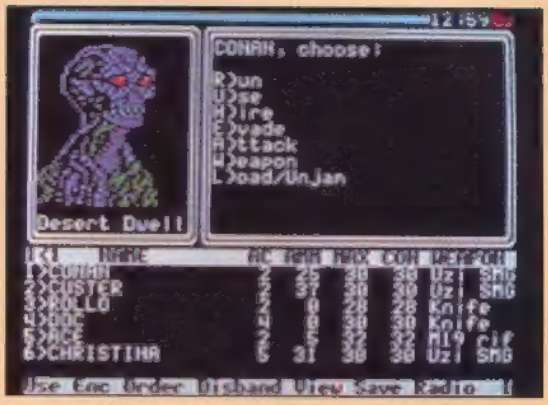
The Survivors



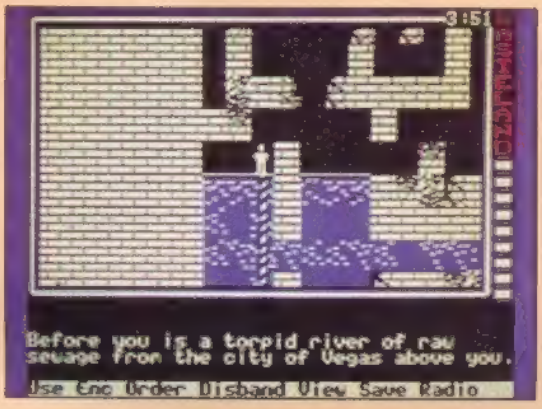
When the nuclear war began a group of U.S. engineers were working on building bridges over dry river beds and ran for cover when the mushrooms started growing. The cover they found was a newly-constructed prison which they occupied, ejecting the former occupants to face the holocaust. They welcomed other survivalist groups but repulsed the attempts of the prisoners to regain what they claimed was "rightfully theirs".

After a few months the prison became known as the Ranger Centre and its occupants the Desert Rangers. As the game begins you control a party of four Desert Rangers who go into the desert to investigate a series of disturbances.

Each member of your party has an exceptional combination of attributes such as strength, dexterity and intelligence and skills to provide a better chance of using a weapon, picking locks, climbing or swimming. You must use those strengths as best as you can to keep your party alive before you delve too deeply into the caves, mines, towns and temples which lie to the west.

Wasteland is one of the few role-playing games which are not filled with spell-casting wizards, dungeons and dragons. Instead it is based in the post-nuclear world where even the lowest thug can wipe out your entire party if he can outgun you with a sub-machine gun against your pistols, knives and crowbars. It is a world where the meanest and nastiest hoodlums have taken over the towns with their gangs of thugs, jerks and gunmen; deadly war machines patrol the big cities and mutants of all shapes and sizes – usually giant – attack anything which may be food.

Parts of the desert still have the glow of radiactivity. They will be deadly to most adventurers and mean that there is no place to run if the going gets tough. Your main problems will be from the almost continuous attack from mutants which range from desert dwellers to the giant slithering lizards and rodents which can attack in large numbers.



Combat demands luck and skill, as each character can decide his actions for each combat round which include Run, use an object or skills, attempt to Hire the opponent, Evade or dodge an attack, swap your Weapon or Load or Unjam a useless gun. A series of scrolling messages will describe the ensuing battle and report on shots which hit their target – damage done to your party members is reflected by the decreasing constitution values displayed at the bottom of the screen along with the weapon chosen, ammunition remaining and any armour they are wearing which may absorb the damage.

Wasteland is big. It is supplied on two double-sided discs together with an instruction manual which outlines the skills your characters can learn, weapons they can find and use and places to visit – including Las Vegas – and a booklet containing 162 paragraphs which are used whenever you meet one of the characters of the game. They can vary from leaders to religious cults, robocop chiefs, bartenders, farmers and gang leaders which seem to exert some control over the low life which populate the towns and attack you at a moment's notice.

One of the leaders is a nasty piece of work called Ugly, who moved into a town and took control by kidnapping the mayor. Your job as defender of truth and justice is to launch a commando attack on their headquarters to get him back. Every time you kill a thug or mutilate a mutant your characters will gain experience which can build to be sufficient to earn them promotion, which brings with it two more points on your constitution, two points to add to your characteristics and perhaps even some more skill points with which you could learn how to defuse bombs, decode messages, gamble or patch up your wounded colleagues.

Wasteland was developed by the team which produced *The Bard's Tale* series and includes Ken St Andre, developer of role-playing games such as *Tunnels and Trolls* and *Monster Monster*, as well as one of the first to pioneer the solo dungeon or fighting fantasy game system. The resulting game will have you brawling in bars and fighting with thugs, punks, mutants and lizards and will have you hooked until your quest is complete – or your entire party is gunned down in the attempt.

Reviewer: Tony Hetherington.
Price: £16.95
Machine: C64
Supplier: Electronic Arts
POPULAR RATING
Graphics: 17
Sonics: 11
Gameplay: 48
76

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LCD Screens – one way of avoiding electronic eavesdropping

Computer security is a topic few users consider when installing computers, either in the office or at home. Steve Gold looks at how easy electronic eavesdropping is and how to avoid such security threats . . .

The realities of the Data Protection Act, the full provisions of which came into force last November, have made computer users more conscious of physical security requirements. Most sensible computer users who use personal data on their systems now lock their machines at nights and at weekends.

There is no room for complacency. It might interest even the most casual computer user to know that his screen and all data keyed-in and flashed on-screen can be viewed at a distance of several hundred yards using equipment costing around £100.

The culprit in this is electrical radiation. Most computer users will have noticed that their machines can cause problems for listeners to medium wave radios for a distance of several tens of yards. This is due to the radio-frequency emissions of the computer PCB and video output. The bulk of the radio emissions are given out by the video output of the computer in question. This is due to the relative strength of the signal required literally to push the video signal down the cable to the monitor.

Because the signal is heavily-modulated it is possible for anyone receiving the radio emissions to decode the signal sufficiently to input to another computer monitor situated some way from the innocent computer user.

Eavesdropping

Although the mechanics of eavesdropping on computer-emitted radiation at a distance have been known by various government security forces since the Second World War, few outside the military upper echelons were aware of the potential security problem until 1985, when Dr Van Eck of the Dutch Telecommunications Authority demonstrated the technology in public at the Securicom Conference in Cannes.

Within weeks the problem was publicised through the specialist electronics magazines throughout Europe. Later that year Tomorrow's World, the BBC TV programme, gave a practical demonstration of the techniques involved. Several of my industry colleagues co-operated actively with the Tomorrow's World technical staff in completing the demonstration.

While the use of computer surveillance techniques may seem to belong to the world of James Bond, its occurrence is more common than most computer users would imagine. Several banks and newspapers have been hacked using radio frequency eavesdropping. Since the equipment involved in electronic eavesdropping of computers can be assembled for slightly more than £100 and the circuit diagrams of the equipment required have been published in several electronics magazines, it is logical to assume that any reasonably competent computer expert could eavesdrop with the same ease as turning in Radio 1 on a Walkman radio.

It does not take the genius of a computer security specialist to protect against electronic eavesdropping. Protection against the real menace of computer eavesdropping is really a matter of combining common sense with practical security considerations. Any electronic or electrical systems (such as a computer) used to process information is likely to radiate signals. In computers, in order of vulnerability, the main offenders are VDUs, printers, communications carriers - bearers and cables - and the computer PCB.

There are two main methods of protecting you and your computer from electronic eavesdropping - a reduction in the ERF given off by the component concerned or to generate a masking signal which effectively swamps the signal which could be eavesdropped.

Maximum power

While there are a few small devices in the latter category which make life difficult for the would-be eavesdropper, the Wireless and Telegraphy Act places a limit on the maximum power which can be pumped out by these units. In practice, it has been shown that masking an electrically-transmitted signal is ineffective against the well-equipped eavesdropper. All those devices do is to make life a little more difficult.

So we are left with trying to reduce the level of the ERF to the point where the potential eavesdropper would have to be too close to the machine in question to decode the signal. This can be achieved in one of the two ways - signal source suppression or signal encapsulation.

Signal source suppression relies on careful circuit design and positioning of computer components in such a way as to minimise the amount of ERF given off by the computer. Most commercially-available computers score badly in this respect, since they are not normally built with such standards in mind. A number of computers are produced with the idea of minimum signal radiation foremost in their specifications. These computers are produced for the government and conform to what is known as the Tempest or NACSIM standards.

Tempest

Tempest is a classified standard issued by the U.S. intelligence services and involves shielding the computer to the extent where little or no ERF leaks. The NACSIM standard is the NATO equivalent of Tempest. Both standards are known only to top military computer producers and staff on either side of the Atlantic.

Signal encapsulation works on the same principles as the metal cases which surrounded many of the earlier computers. By shielding the computer any stray radiation which could interfere with other electrical machines nearby, e.g. TVs and radios, is minimised.

One of the most effective encapsulation techniques used by banks and financial institutions involves the installation of a chicken wire mesh cage round the computer or computer room. By earthing the wire cage any stray radio signals can be trapped and led to earth.

Some business computer users think such security precautions are unnecessary. As a recent case involving the Comet and Dixons store chains showed, industrial espionage has reached the point where even a private detective can use electronic eavesdropping as a means to garner useful information.

One of the most effective ways of preventing electronic eavesdropping has been on the computer market for several years - non-VDU screens. Most portables and lap-tops now use liquid crystal display or gas plasma technology as the means of displaying the screen output.

LCDs are the most effective method of avoiding electronic eavesdropping, since they are refreshed only when data on the screen changes. Usually the electrical refresh impulses are so weak as to be undetectable more than a few inches from the computer.

Gas plasma technology, although not so quiet electrically as LCD screen systems, is still much quieter in electrical terms than conventional VDUs. Unfortunately gas plasma technology is still a little too costly for most users' needs. Recent advances in LCD screen technology have made the gas plasma screens appear rather over-priced. Having said that, some of the popular Toshiba lap-tops, notably the T3100 series, still use gas plasma technology.

As a computer journalist I am asked occasionally about computer security. In one case I discovered a financial colleague to have a security problem in that his offices were located across the street from a rival bank's headquarters. Naturally, the risk was very slight that such well-respected financial institutions would employ such underhand tactics as electronic eavesdropping but the risk was quantifiable and very real considering the large volumes of bank customers' money which was processed through the office in question.

After obtaining several quotations to screen the offices in which he maintained his computers, my colleague requested my help. After surveying the offices in question briefly, I discovered that the safe was situated along one wall of the office.

By carefully relocating the two most sensitive - in financial terms - computers behind the safe and away from the window, the potential for electronic eavesdropping was reduced considerably.

In this case, common sense saved the bank concerned more than £8,000 in security installations. It also taught me that some computer security salesmen can be over-zealous when selling their systems. A little common sense can often reap big dividends. □

A typical inshielded computer installation

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SOFTWARE HOTLINES

SOFTWARE HOTLINES

By now all Amiga owners will be struggling with the wheel of death, the centre of the copy protection for *F/A 18 Interceptor* from Electronic Arts.

The wheel must be consulted every time you collect a new option from the main menu, except for the demonstration.

Before you C64 owners become too smug, beware – the wheel is on its way in *The Bard's Tale III*.

A little-known fact about these fiendish little devices is that on the early pre-production versions of F/A 18 Interceptor the wheels were constructed by Electronic Arts public relations officer Lesley Mansford using a blunt instrument. At this point I would like to say that we really appreciate this – honestly.

Due to a total lack of a witty introduction, I will get straight to the point. Not only are sports game fanatics in for a treat but for the first time in the history of this planet – assuming you do not believe in cyclic civilisations – *Summer Games I* and *II* will be available for Amstrad and Spectrum computers.

The games will be released as part of the Gold, Silver, Bronze collection, which will feature the 28 events that can be found in Summer Games I, Summer Games II and *Winter Games*.

Staying with the sporting theme, *Summer Olympiad* is a collection of sports games for the Atari ST. The demonstration which arrived in the post looked very good but until the games are finished and I get to grips with the gameplay it is a little too early to say whether Tynesoft has a hit on its hands or not, but the early results would suggest so.

At this point I would like to take a firm grip on my leg and pull my foot firmly out of my mouth – why change the habits of a lifetime?

As we all know, Rainbird does not write games. It promotes and distributes them:

Whirligig – the name of the game that I spelt incorrectly last time – is being programmed by Mike Singleton and a very good job he is doing.

His previous work includes such gems as *Lords of Midnight* and *Dark Sceptre*.

David Braben, co-author of *Elite*, is responsible for the conversion of *Zarch*, the Archimedes classic, to *Virus* for the ST and Amiga.

The long-awaited sequel to *Starglider*, *Starglider 2* – a game I am dying to play – hint, is being developed by Argonaut Software, which is headed by one Jez San.

Last but by no means least is Realtime Graphics, which is in fact the operational name of Ian Oliver, Graham Baird and Andy Onions.

Realtime Graphics is responsible for the Z-80 and IBM PC versions of *Starglider* and the IBM version of Elite. Perhaps their most notable contribution to the entertainment of the masses is *Carrier Command*, a game which took the industry by storm.

Adrian Pumphrey

PUZZLE

"This is interesting", said Jamie to Ben, handing him a pocket calculator. "Enter the number 1599 and then multiply it in turn by the numbers 2 to 9 and note the results." Ben jabbed away at the calculator and scribbled the following list:

1599 × 2 = 3198
× 3 = 4797
× 4 = 6396
× 5 = 7995
× 6 = 9594
× 7 = 11193
× 8 = 12792
× 9 = 14391

"Note how none of the products contains a single zero", continued Jamie. "In fact, it is easy to find a number of values with this peculiarity. What I was wondering was if there are any set of products in which every value contained at least one zero. The initial number must contain four digits and, to make it more difficult, must not itself contain a zero – but every product formed by multiplying from 2 to 9 must include a zero."

After a few minutes Ben reported "I have found 1512, which scores zeros in seven out of the eight products. Only 1512 times 3 does not contain a zero".

Can you do any better and find a number which scores eight out of eight? □

PUZZLE SOLUTION

Solution to puzzle Village Triangulations of June 16-22.

The distances were:

Amblebury to Birchmere, 4,060 yards
Amblebury to Cobbleham, 4,059 yards
Birchmere to Cobbleham, 5,741 yards

From the information given the three villages stand at the angles of a right-angled triangle, with the Birchmere to Cobbleham distance being the hypotenuse and the other two distances differing by just one yard. If the smaller of the two legs is 'S', the larger will be S+1. In the program these two values are placed in variables S and L. The hypotenuse (H) is found by using Pythagoras' Theorem. For the answer to be correct, this must be an integer – whole number.

```
>
  100 S=3500
  110 L=S+1
  120 Z=S*S+L*L
  130 H=SQR(Z)
  140 H=INT(H+.5)
  150 IF H*H=Z THEN
  PRINT S;" ";L;" ";H
  160 S=S+1:GOTO 110
```

Because of certain inaccuracies found when square roots are computed by most micros, lines 140 and 150 use a technique to overcome this by checking by direct multiplication – which is accurate – that the square root, when squared, is equal to the square from which it had been computed.

As the distance from Birchmere to Cobbleham was estimated at 'about three miles', the minimum distance of the smallest of the two legs is taken as 3,500 yards. □

Synthesising sound on the Atari ST

Kenn Garroch explains the working of a program which will allow you to implement full ADSR envelope generation using the Atari ST sound chip.

The Atari ST is not blessed with the world's greatest sound system and, unless you have access to sound sampling equipment, getting the internal sound chip to produce any reasonable sound effects can be somewhat difficult. The problem lies with the rather basic nature of the AY 2149 sound chip used in the ST. It has three tone channels, one noise channel and an enveloping system - see figure one. In the normal course of events, sounds will consist of turning the tones on and off to produce beeps and selecting envelopes to get pre-defined attacks and decays. The ST, however, has a reasonably good and easily-accessible interrupt system, the simplest being the Vertical Blank interrupt which occurs every time the screen is updated by the system. Using this and a little machine code programming it is possible to enhance the possibilities of the sound chip to the point where complete ADSR - Attack, Decay, Sustain and Release - envelopes, modulated sounds, and other tricks which are standard on other sound processors, e.g. the SID in the C64, are possible.

Basic idea

The basic idea of the program is to use the interrupt to run a routine which reads through a sequence of instructions which can, in turn, be used to program the sound chip. There are three channels, each with its own instruction list and, within the capabilities of the sound chip, is completely independent. There are 12 instructions in the program shown but after studying the process a little, other instructions and options can easily be added to provide an even more flexible system.

The most basic instruction is that used to turn a channel on and select its pitch and volume. Looking at the layout of the sound chip in figure one you can see that the pitch of a channel is set with a 12-bit value, giving a range of values from 0-4095. The first 8-bit register is generally known as the fine tune or FT and the second 4-bit coarse tune or CT and the frequency produced by setting these bits is:

$$\text{Freq} = \frac{2000000}{16*((256*CT)+FT)}$$

Giving a complete range from 30.5Hz to 125KHz.

Instructions 1, 2 and 3 are used to set the pitch, mixer setting and volume/envelope select for channels A, B and C respectively. Following the instruction number, two bytes are used to define FT and CT. The next byte is the mixer - reg 7 - setting and each bit apart from the topmost - bit 7 - corresponds directly to the layout shown in figure one. Bit 7 is to tell the program whether to set the relevant bits or whether to clear them. So to turn on tone channel A, the value %00000001 is used. The % sign normally defines a binary number for most assemblers.

When bit 7 is set to 0 the program interprets this as 'set the following bits' in the mixer register. If it is set to 1 the program will clear the specified bits. To turn off tone channel A use the value %10000001. This arrangement means you can ignore any previous settings, i.e., those used by other channels, and specify the bit of the mixer required for the operation.

The final byte of this instruction is used to set the volume of the channel - A, B or C, 1, 2 or 3 - to tell the sound chip to use the built-in envelope generator. The lower four bits - values from 0-15 - are volumes, the fifth bit - actually bit 4 since the first is bit 0 - specifies an envelope and the lower four are ignored. So to set up channel A (or 1) to play an 'A' (440Hz) at full volume, use the following:

```
1,2,28,%00000001,15
```

Substitute 2 or 3 in the first byte for channels B and C and move the mixer bit left to the correct position for the channel - see figure one. There is only one noise channel in the sound chip and it is used for all three channels. The pitch or frequency of the noise can be set with instruction 4. This is a value from 0-255 and the frequency is found with the formula:

$$\text{Freq} = \frac{2000000}{16*N}$$

where N is the value in the noise pitch register - reg 6 - and gives a range of 4KHz to 125KHz. The instruction is simple, i.e., 4,0 will give the highest pitch noise - a hiss. To get a channel to make the noise, the noise bit in the mixer must be selected. So the commands are:

```
4,0
2,0,0,%10010000,15
```

Set channel B to produce noise at full volume.

The final command which affects the sound chip directly is No. 5 which selects the internal envelope and its period. There are three bytes following the command. The first two select the time of the envelope, i.e., 0-65535, low eight bits followed by high eight bits. To define the period use (EL+(256*EH)) where EL and EH have values from 0-255.

Envelope type

The third byte value selects the envelope type to be used. Figure two shows the possibilities, they are not very exciting but as you will see later this can be improved by using the program. As an example of a 'ping' like the bell sound on the ST, use:

```
snaista dc.b 1,0,1,%10000001,1,16
```

which selects channel A for pitch, mixer and envelope. Followed by:

```
dc.b 5,0,64,0
```

which selects an envelope period of 64*256 (163384) and envelope type 0. It also activates the envelope generator in the sound chip.

Instruction No. 6 does nothing and is available to mark time, basically it is No Operation or NOP and does nothing but

move the instruction pointer to the next command.

The next two instructions are used to make the program loop. The first - No. 7 - saves the current position of channel A, and the second - No. 8 - causes the program to jump back to the saved position. This allows sounds to be repeated over and over again. Instructions 9 and 10 and 11 and 12 do the same thing but for channels B and C.

Turning on

To turn on a channel, the instruction pointer for the channel, held in memory location 'sndposa(b/c)' must be set up with the address of the instruction list for the sound to be used on the channel. Then the flags in sndnfa(b/c) should be set to 1. If the list of instructions does not loop it should be terminated with a value of 255. This causes the program to stop reading instructions and clear the on/off flag for the channel.

The operation of the program is straightforward. The interrupt routine is set up by replacing the standard vertical blank interrupt routine with the new sound processing one. Note that this disables parts of the disc system and some of the internal clocks but since they are not necessary to the program they can be ignored. The keyboard click is turned off, since it interferes with any sounds you might set up on channel A, and then the keyboard is scanned for one of four keys.

Pressing 1 tells the program to run through the list of instructions of channel A, 2 is for B and 3 is for C. Escape is used to exit back to the system. This is rather basic but shows how the program can be incorporated into your own. All you need do is set up the pointer and flip the flag and the sound will start. A glance through the comments should enable new commands to be added; put them in the list and write a routine.

As an example of a programmed envelope, look at the data list sndlstc. It creates a three-tone bell sound on one channel (C) and starts with the volume at 15. As the instructions are read, the volume is reduced to give a fading envelope while altering the pitch to get the three tones. By changing the number of times the various volumes are repeated, the shape of the envelope can be modified. Sndlstb uses the internal envelope system to create its noise sound but alters the frequency as it goes.

Sndlsta shows the effect of the repeat and how the pitch and volume can be changed while the sound is in progress. A little experiment should show that with this program you can generate fairly sophisticated sounds from what is, at heart, a simple sound system. □

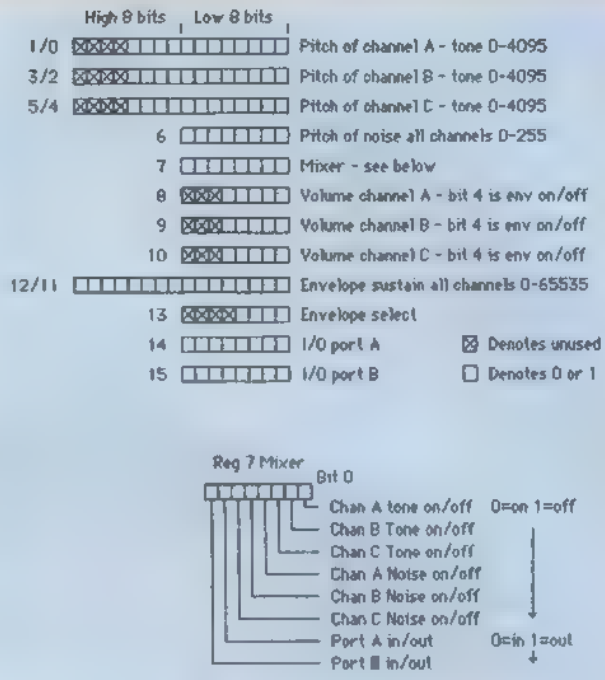

Fig 1 - Sound chip internal registers

Fig 2 - Envelopes selected from sound chip register 13.

Command No.	Byte 1	Byte 2	Byte 3	Byte 4	Comment
0	No other parameters needed				Turn all sounds off
1	Pitch low	Pitch high	Mixer	VolumeA	Set up channel A
2	Pitch low	Pitch high	Mixer	VolumeB	Set up channel B
3	Pitch low	Pitch high	Mixer	VolumeC	Set up channel C
4	Noise pitch	Ignore	Ignore	Ignore	Set noise pitch
5	EL	EH	Env sel	Ignore	Select and set envelope
6	No other parameters needed				No operation
7	No other parameters needed				Save current address A
8	No other parameters needed				Jump to current address A
9	No other parameters needed				Save current address B
10	No other parameters needed				Jump to current address B
11	No other parameters needed				Save current address C
12	No other parameters needed				Jump to current address C

Summary of commands available to program.

continued on page 18 ▶

◀ continued from page 17

```
START   MOVE.L    A7,A5              Standard program header
        MOVE.L    *USTK,A7
        MOVE.L    4(A5),A5
        MOVE.L    $C(A5),D0
        ADD.L     $14(A5),D0
        ADD.L     $1C(A5),D0
        ADD.L     #$100,D0
        MOVE.L    D0,-(SP)
        MOVE.L    A5,-(SP)
        MOVE.W    D0,-(SP)
        MOVE.W    #$4A,-(SP)
        TRAP      #1
        ADD.L     #12,SP
        BSR       GO
        MOVE.L    #0,-(SP)
        TRAP      #1
vbls    ds.l      1                  Save VBL vector here
GO      bsr       super              Into super mode
        move.l    $70,vbls           And save old VBL
        move.l    #vbl,$70           Insert new one
        move.b    $484,d0            Read keyboard settings
        and       #$f8,d0            Disable key click
        move.b    d0,$484            And restore
go1     bsr       rkey               Scan keyboard
        cmp.b     #0,d0              If D0=0 then no key
        beq       go1                So wait for one to be pressed
        cmp.b     #1,d0              Is it a 1?
        bne       go12               No, check next
        move.l    #sndlsta,sndposa   Set up sound list A
        move      #1,sndnfa          And flag it ON
        bra       go1                Back to key wait
go12    cmp.b     #2,d0              Is it a 2?
        bne       go13               No then check next
        move.l    #sndlstb,sndposb   Set up sound list B
        move      #1,sndnfb          And flag it ON
        bra       go1                BAck to wait for a key
go13    cmp.b     #"S",d0            Is the key a S?
        bne       go14               No then next
        move.l    #sndlstc,sndposc   Set up sound C
        move      #1,sndnfc          And turn it on
        bra       go1                Back to key wait
go14    cmp.b     #27,d0             Escape for end of prog
        bne       go1                Is it?
        move.l    vbls,$70           Appears to be, replace original VBL
        lea       $ff8800,a0         And select the Sound chip
        move.b    #7,(a0)            Register 7 (mixer)
        move.b    #$3f,2(a0)         Turn all chans off
        bsr       usuper             Back to user mode
        rts                          And exit program

* New VBL routine - calls each program in order
vbl     bsr       sndprga            Do list A
        bsr       sndprgb            Do list B
        bsr       sndprgc            Do list C
        rte                          Exit exception
* Command list - each entry is the address of the routine
sndjmp  dc.l      sndoff             Instr 0 - Sound chip off
        dc.l      sndsta             Instr 1 - Set chan A params
        dc.l      sndstb             Instr 2 - Same for B
        dc.l      sndstc             Instr 3 - Same for C
        dc.l      sndnop             Instr 4 - Set noise freq
        dc.l      sndenv             Instr 5 - Set up env regs
        dc.l      sndnop             Instr 6 - NOP
        dc.l      sndstra            Instr 7 - Store current pointer A
        dc.l      sndjsta            Instr 8 - Jump to stored pointer A
        dc.l      sndstrb            Instr 9 - Store current pointer B
        dc.l      sndjstb            Instr 10 - Jump to stored pointer B
        dc.l      sndstrc            Instr 11 - Store current pointer C
        dc.l      sndjstc            Instr 12 - Jump to stored pointer C

sndaddr dc.l      sndlsta            Pointer store for loop A
sndaddb dc.l      sndlstb            Loop B
sndaddc dc.l      sndlstc            Loop C

sndstra move.l    a1,sndaddr         Store current A pointer
        addq.l    #1,a1              Next instruction
        rts
sndjsta move.l    sndaddr,a1         Jump to stored address A
        addq.l    #1,a1
        rts
sndstrb move.l    a1,sndaddb         See above for A
        addq.l    #1,a1
        rts
sndjstb move.l    sndaddb,a1         And here
        addq.l    #1,a1
        rts
sndstrc move.l    a1,sndaddc
        addq.l    #1,a1
        rts
sndjstc move.l    sndaddc,a1
        addq.l    #1,a1
        rts

* All sounds off - Code 0
sndoff  move.b    #7,(a0)            Select mixer
        or.b      #63,2(a0)          Mixer all off
        move.b    #8,(a0)            Chan A vol
        move.b    #0,2(a0)           And zero
        move.b    #9,(a0)            Zero volumes for B
        move.b    #0,2(a0)
        move.b    #10,(a0)           And C as well
        move.b    #0,2(a0)
        addq.l    #1,a1                                  Next pos
        rts

* Set up channel A - code 1
sndsta  move.b    #0,(a0)            Select A freq lmw
        move.b    1(a1),2(a0)        Write 1st byte
        move.b    #1,(a0)            A freq high
        move.b    2(a1),2(a0)        Write 2nd byte
        move.b    #8,(a0)            Select A volume
        move.b    4(a1),2(a0)        And write setting
        move.b    #7,(a0)            Select mixer
        move.b    3(a1),d0           -ve set bits +ve reset
        tmi       sndstas            Do set or reset
        eor.b     #$FF,d0            Invert bits for AND
        and.b     (a0),d0            Read the mixer setting and reset bits
        move.b    d0,2(a0)           And replace
        addq.l    #5,a1              Set pointer to next instruction
        rts
sndstas and.b     #$7F,d0            Chop signal bit (7)
        or.b      (a0),d0            Or these
        move.b    d0,2(a0)           And set bits
        addq.l    #5,a1              Next instruction
        rts

* Set up chan B - code 2
sndstb  move.b    #2,(a0)            This works as sndsta
        move.b    1(a1),2(a0)        But for channel B
        move.b    #3,(a0)
        move.b    2(a1),2(a0)
        move.b    #9,(a0)
        move.b    4(a1),2(a0)
        move.b    #7,(a0)
        move.b    3(a1),d0
        tmi       sndstbs
        eor.b     #$FF,d0
        and.b     (a0),d0
        move.b    d0,2(a0)
        addq.l    #5,a1
        rts
sndstbs and.b     #$7F,d0
        or.b      (a0),d0
        move.b    d0,2(a0)
        addq.l    #5,a1
        rts

* Set up chan C - code 3
sndstc  move.b    #4,(a0)            And this does the same for channel C
        move.b    1(a1),2(a0)
        move.b    #5,(a0)
        move.b    2(a1),2(a0)
        move.b    #10,(a0)
        move.b    4(a1),2(a0)
        move.b    #7,(a0)
        move.b    3(a1),d0
        tmi       sndstcs
        eor.b     #$FF,d0
        and.b     (a0),d0
        move.b    d0,2(a0)
        addq.l    #5,a1
        rts
sndstcs and.b     #$7F,d0
        or.b      (a0),d0
        move.b    d0,2(a0)
        addq.l    #5,a1
        rts

* Noise pitch set - code 4
sndnop  move.b    #6,(a0)            Select noise pitch
        move.b    1(a1),2(a0)        And write new value
        addq.l    #2,a1              Next instruction
        rts

* Set up envelope - code 5
sndenv  move.b    #11,(a0)           Select env period low
        move.b    1(a1),2(a0)        Write new value
        move.b    #12,(a0)           Select env period high
        move.b    2(a1),2(a0)        Write new value
        move.b    #13,(a0)           Select env type
        move.b    3(a1),2(a0)        And set it up
        addq.l    #4,a1              Next instruction
        rts

* No operation - code 6
sndnop  addq.l    #1,a1              Just increment pointer
```

```
        rts
sndnfa  dc.w    $        Sound flagA  0=off
sndnfb  dc.w    0        Sound flag B
sndnfc  dc.w    0        Sound flag C
sndposa dc.l    sndlsta  Sound program counter A
sndposb dc.l    sndlstb  PC B
sndposc dc.l    sndlstc  PC C

* Chan A prog executor
sndprga tst     sndnfa   Is the sound ready to go?
        bne     sndpgaa  Non-zero is yeah
        rts
sndpgaa movem.l  a0-a3/d0,-(sp)  Save regs to be used
        lea     $ff8800,a0       Point to sound chip
        move.l  sndposa,a1       Get pointer to instruction
        move.b  (a1),d0          Get code
        cmp.b   #255,d0          End of list?
        beq     sndpgfa          Marker 255 is end
        lea     sndjmp,a3        Get cmd list pointer
        and.l   #$ff,d0          Make d0 into a long (actually, a word would do)
        lsl     #2,d0            Times 4 for instruc fmat
        move.l  0(a3,d0),a3      Get subroutine address
        jsr     (a3)             And go for it
sndpgaa move.l  a1,sndposa       Restore pointer
sndpgea movem.l  (sp)+,a0-a3/d0  Get regs
        rts
sndpgfa clr     sndnfa           Sound off so clear flag
        bra     sndpgea          And exit (remember stack)

* Chan B executor
sndprgb tst     sndnfb           Is the sound ready to go?
        bne     sndpgab          None zero is yeah
        rts
sndpgab movem.l  a0-a3/d0,-(sp)  Same as for chan A
        lea     $ff8800,a0       But for chan B
        move.l  sndposb,a1
        move.b  (a1),d0
        cmp.b   #255,d0
        beq     sndpgfb
        lea     sndjmp,a3
        and.l   #$ff,d0
        lsl     #2,d0
        move.l  0(a3,d0),a3
        jsr     (a3)
        move.l  a1,sndposb
sndpgeb movem.l  (sp)+,a0-a3/d0
        rts
sndpgfb clr     sndnfb
        bra     sndpgeb

* Chan C executor
sndprgc tst     sndnfc           Same as A but
        bne     sndpgac          For chan C
        rts
sndpgac movem.l  a0-a3/d0,-(sp)
        lea     $ff8800,a0
        move.l  sndposc,a1
        move.b  (a1),d0
        cmp.b   #255,d0
        beq     sndpgfc
        lea     sndjmp,a3
        and.l   #$ff,d0
        lsl     #2,d0
        move.l  0(a3,d0),a3
        jsr     (a3)
        move.l  a1,sndposc
sndpgec movem.l  (sp)+,a0-a3/d0
        rts
sndpgfc clr     sndnfc
        bra     sndpgec

* Enter supervisor mode
super   clr.l   -(sp)            Standard procedure
        move    #$20,-(sp)       Necessary since
        trap    #1               Sound chip is in a
        addq.l  #6,sp            Protected area
        move.l  d0,stksve        Of memory
        rts
stksve  ds.l    1                This is where the old super stack goes

* Back to user mode
usrper  move.l  stksve,-(sp)     Use before leaving
        move    #$20,-(sp)       Since GEM likes to be
        trap    #1               In user mode
        addq.l  #6,sp
        rts

* Read a keypress (0=0 if no key
rkey    move.l  a0,-(sp)         Standard system comin
        move    #$ff,-(sp)       Command
        move    #6,-(sp)
        trap    #1
        addq.l  #4,sp
        move.l  (sp)+,a0
        rts

* List of instructions for chan C
sndlstc dc.b    $        All sounds off code
        dc.b    3,0,1,%00000100,15
        dc.b    3,0,2,%00000100,15
        dc.b    3,0,3,%00000100,15
        dc.b    3,0,1,%00000100,14
        dc.b    3,0,2,%00000100,14
        dc.b    3,0,3,%00000100,14
        dc.b    3,0,1,%00000100,13
        dc.b    3,0,2,%00000100,13
        dc.b    3,0,3,%00000100,13
        dc.b    3,0,1,%00000100,12
        dc.b    3,0,2,%00000100,12
        dc.b    3,0,3,%00000100,12
        dc.b    3,0,1,%00000100,11
        dc.b    3,0,2,%00000100,11
        dc.b    3,0,3,%00000100,11
        dc.b    3,0,1,%00000100,10
        dc.b    3,0,2,%00000100,10
        dc.b    3,0,3,%00000100,10
        dc.b    3,0,1,%00000100,9
        dc.b    3,0,2,%00000100,9
        dc.b    3,0,3,%00000100,9
        dc.b    3,0,1,%00000100,8
        dc.b    3,0,2,%00000100,8
        dc.b    3,0,3,%00000100,8
        dc.b    3,0,1,%00000100,7
        dc.b    3,0,2,%00000100,7
        dc.b    3,0,3,%00000100,7
        dc.b    3,0,1,%00000100,6
        dc.b    3,0,2,%00000100,6
        dc.b    3,0,3,%00000100,6
        dc.b    3,0,1,%00000100,5
        dc.b    3,0,2,%00000100,5
        dc.b    3,0,3,%00000100,5
        dc.b    3,0,1,%00000100,4
        dc.b    3,0,2,%00000100,4
        dc.b    3,0,3,%00000100,4
        dc.b    3,0,1,%00000100,3
        dc.b    3,0,2,%00000100,3
        dc.b    3,0,3,%00000100,3
        dc.b    3,0,1,%00000100,2
        dc.b    3,0,2,%00000100,2
        dc.b    3,0,3,%00000100,2
        dc.b    3,0,1,%00000100,1
        dc.b    3,0,2,%00000100,1
        dc.b    3,0,3,%00000100,1
        dc.b    3,0,1,%00000100,0
        dc.b    255

* List of instructions for chan B
sndlstb dc.b    3,0,0,%00100000,16
        dc.b    5,0,64,0
        dc.b    4,101
        dc.b    4,91
        dc.b    4,81
        dc.b    4,71
        dc.b    4,61
        dc.b    4,51
        dc.b    4,41
        dc.b    4,31
        dc.b    4,21
        dc.b    4,11
        dc.b    255

* List of instructions for chan A
sndlsta dc.b    7                Remember this address
        dc.b    1,0,1,%00000001,15
        dc.b    1,2,1,%00000001,15
        dc.b    1,4,1,%00000001,15
        dc.b    1,6,1,%00000001,14
        dc.b    1,8,1,%00000001,14
        dc.b    1,10,1,%00000001,14
        dc.b    1,12,1,%00000001,13
        dc.b    1,14,1,%00000001,13
        dc.b    1,16,1,%00000001,13
        dc.b    1,18,1,%00000001,12
        dc.b    1,20,1,%00000001,12
        dc.b    1,22,1,%00000001,12
        dc.b    1,24,1,%00000001,11
        dc.b    1,26,1,%00000001,11
        dc.b    1,28,1,%00000001,11
        dc.b    1,30,1,%00000001,10
        dc.b    1,32,1,%00000001,10
        dc.b    8                Jump back to remembered address
        even
        DS.L    256
USTK    DS.L    1                User stack of 256 longs
        EVEN
```

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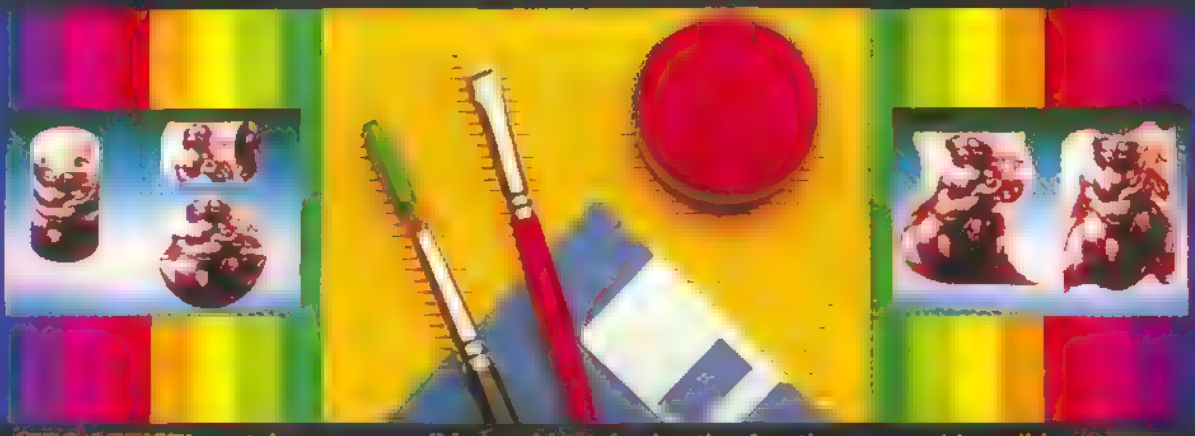

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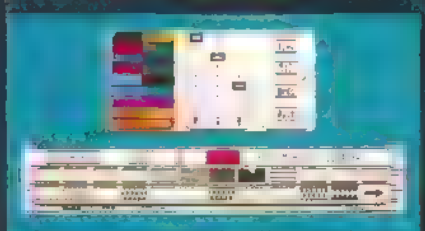

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[illegible]

[illegible]

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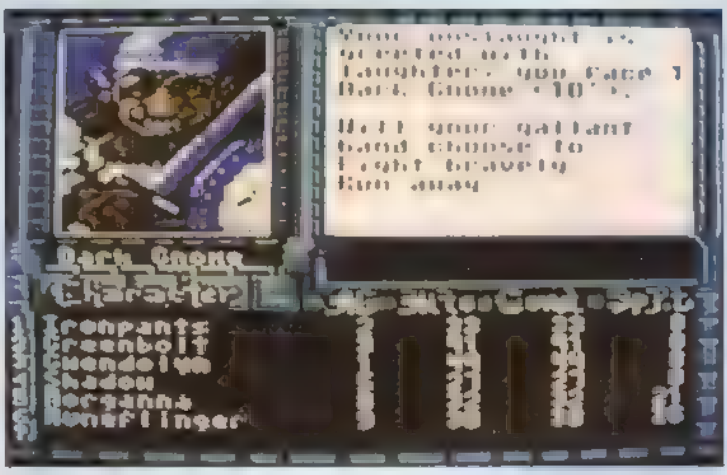
PCW1

The curse of the Mad God

Ken Matthews gets down to the nitty gritty of *Bard's Tale III* and rounds up some adventure games soon to be released such as *Land of Legends* and *Return to Doom*.

Tarjan's vengeance was swift and terrible. Skara Brae lies bare and ruined following the god's awful onslaught. A few refugees camp in a pitiful collection of tents which overlook the wreckage of the once-fair city. The Mad God turns his wrath elsewhere and the dispirited survivors ponder the bleak future and speculate how the Evil One can be stopped.

This bleak scenario is the start of the latest in the award-winning *Bard's Tale* series, as those who read the last issue will appreciate. Subtlety and logic are claimed as the bywords for this chapter of the Tale.



Bard's Tale III

> **"The Bard's songs now seem much more useful and, as the title, *The Thief of Fate*, suggests, the rogue class must really come into its own in this game. The thief's abilities are now listed separately, as in *Dungeons and Dragons*."**

Briefly, your party must travel through the seven dimensions to discover the source of Skara Brae's destruction. Along the way you will need to collect the spells and items to aid you in your confrontation with the Evil One.

Dimension travel is new to this version and requires one of the new mage skills, Chronomancy, before such hops are possible. New spells have been added to give more than 100 in all. The Ultimate mage is now the Geomancer who can tame Earth itself to deal out awesome damage to foes so long as the spell points last. When his power is spent, though, he can use most of the weapons of the fighter classes. The Pathfinder spell shows a plan view of the whole of a dungeon level to prevent you getting lost.

With 84 dungeon levels to explore on the different dimensions is sensible have the ability save almost at will and the characters have been given a great deal of thought and development as well.

The Bard's songs now seem much more useful and, as the title, *The Thief of Fate*, suggests, the rogue class must really come into its own in this game. The thief's abilities are now listed separately, as in *Dungeons and Dragons*. I am sure this will give pleasure to many veteran Bardsters, including Jim Piper of Farleigh Wallop, who sent me his thoughts on the subject.

Unprotected

The game disc is unprotected to allow back-up and faster loading. Protection is provided for in the form of the code wheel which is needed for those inter-dimensional jaunts.

Needless to say, with so much in the package, I have only just started but the gameplay is superb and very absorbing. The animation of characters is excellent and atmospheric. My package is the colourful, fold-out American version and has a large format manual and code wheel. I hope Electronic Arts will introduce this as

continued on page 24 ▶

◀continued from page 23

U.K. packaging as it greatly increases the 'feel' of the product and is a great improvement over the disc-sized plastic cases used to date.

Bard's Tale III, The Thief of Fate is a superb product and by far the best role-player available for the C64. The way in which the series has evolved is typical of the Electronic Art continual struggle for excellence and its dedication to more serious software. I await the 16-bit versions with relish.

Land of Legends

Mediagenic/Activision is set for a July release of the MicroIllusions title *Land of Legends* for the Amiga. Using a 3D format for general exploration and bird's-eye views for combat sequences, all the classic D&D features are promised.

Good news next for the purists. Topologika has released the latest game from ace programmer Peter Killworth.

He has been around for a long time, having produced a series of brilliantly-designed and tough games for the BBC range of machines.

His book on writing adventures on the BBC was a classic. One of his most memorable games was *Countdown to Doom*, a bid to escape the planet Doomawangara where your ship had crashed.

Now you must *Return to Doom* in the new title to rescue an ambassador captured by renegade robots. The start of the game is deceptively simple but soon the Kilworth touch appears. Weird alien creatures, strange artefacts and space-born diseases dog your every step and, speaking of dogs, a little friend can be obtained, very reminiscent of the Infocom empathic robot Floyd.

Over-priced?

Despite the built-in help function, Balsak has yet to complete this top-notch text game but it is good to see a professional, bug-free game which holds the attention without pretty pictures and gimmicks. Return to Doom is available on most 8-bit formats except the C64 but may be a little over-priced at £12.95. You can order from Topologika, PO Box 39, Stilton, Peterborough PE7 3RL.

Now a moment to pause for thought and ponder the philosophy of adventuredom in general and the Balsak approach in particular.

Many of you have written in praise of the column and a few with constructive criticisms which I have done my best to accommodate.

You will remember at the outset that my aim is to produce a chatty, informal column with a blend of adventure, role-playing and strategy reviews, news, tips and a forum for your opinions.

Award winning games from Electronic Arts

Dozens of you want to know what I have played, what my criteria are for judging products, do I detest arcade games, why do we not have a weekly column?

Ramblings

You can see that the answers could fill the column for several weeks and not leave space for the other features I feel more important than my ramblings. Also much of it is covered in a piece I have been asked to write for The Adventurers' Club. I will be happy to supply a copy if you send an S.A.E. after the article has been published; I will let you know when.

A few words on the other points. I play arcade games but my reflexes are about as fast as those of an arthritic sloth, so I tend to prefer the slower types with some strategy element, like *Wizball*, *Bubble Bobble* and particularly two German imports, *Giana Sisters* and the brilliant *Emerald Mine*.

Bi-weekly

We do not have a weekly column for editorial reasons. We decided I could cover more in a bi-weekly, two-page column than with a weekly page.

You do not tend to see me criticise a product too often because I hate to waste valuable space with vitriolic prose about a sub-standard game.

I would rather spend time on some details of titles I think contribute to our sector of the software market.

If I cannot detect a single good feature in a piece of software, I prefer to ignore it.

If a game falls into the so-so category I usually cover it, remembering, as I hope you do, that any review is only one person's opinion and tastes differ.

High note

To end on a high note, I have now received more than 60 letters which, among other things, all included requests for help on *Dungeon Master*. Most now seem to be about two problems. First, 'When is Rock not Rock'? The answer being – when you can walk through it. Try walking into the wall to the left of the inscription.

Many have recovered the Firestaff but are not sure what to do next. I shall not wreck the game by telling you but if you read the instruction book and the scrolls on level 7 carefully you should be able to work it out.

I sign off with the promise of a treat for wargamers next time. There are some real scorching titles from Electronic Arts but you will need to buy a C64 before reading – it is well worth it. □

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Marauder – CBM 64

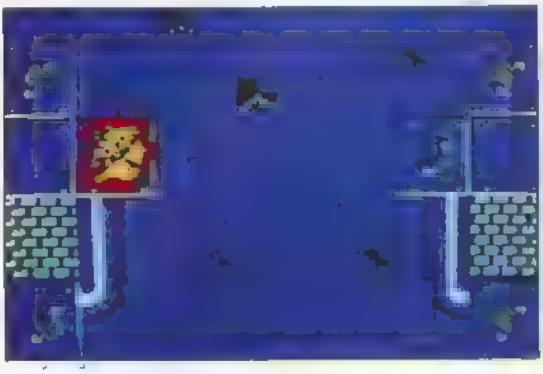
Captain C.C. Cobra gunned the engine of his *Marauder* Battlecar and patted the front-mounted laser cannon fondly. Today the weakening auto-defences of Megatron would fall and the jewels of Czymandius would be returned to their people.

The jewels are located deep beneath the planet Megatron, placed there by a cruel and despotic race after their theft. Captain C.C. Cobra intends to attack the planetary defences in his Marauder land vehicle and recover the jewels.

This horizontally-scrolling shoot-'em-up allows you [illegible] participate in the heroic deeds of Captain C.C. Cobra as he moves up the screen taking out the planetary defences. Not only [illegible] the Marauder armed with a laser cannon but [illegible] also has a limited supply of smart bombs which can be used to eliminate all nasties inhabiting the screen. Track-bound vehicles fire barrages of bullets and missiles, while airborne nasties drop bombs and throughout this manic maelstrom you must guide a rather sluggish attack craft and blast a path through the mayhem.

Shooting the pulsating defence beacons has a range of effects on your craft, depending on its colour when shot. The effects range from 10 seconds of invincibility [illegible] a reversal of the craft controls.

The game is presentable with pleasant graphics and sound effects but there [illegible] nothing about [illegible] that makes it stand out from the crowd. A strictly average offering.



Reviewer: [illegible]
Price: [illegible]
Supplier: [illegible]
POPULAR RATING
Graphics: [illegible]
Sonics: [illegible]
Gameplay: [illegible]
65

The Fury – Amstrad CPC

Hailed as a space age demolition derby, *The Fury* will take you to the middle of the Universe to do motorised battle at Warp Factor 10. It is set on a looping track, otherwise known as a rim and, as Earth's champion, you must enter into battle with the reckless and cunning victors of all the known worlds.

Sounds exciting? Well, not really. Your skill and expertise will ensure the accumulation of Galactic Groats, the official currency. They are necessary to buy the more sophisticated cars and equipment which are essential if you are to stand a dog's chance against the nasty Noid-controlled cars. Noids, in case you are interested, are the lowest form of life, struggling to become Real Rim Racers by completing the circuit successfully.

Each Noid has a bounty on his or her head, so as you eliminate them you gain more Groats. You can spend them on basics like fuel and repairs or weapons like flame throwers, machine guns and missiles, which can kill [illegible] to six Noids. The most expensive buy is the Anome car, which will cost a hefty 14,000g. For that price you will achieve the greatest speed and get the best protection.

If that sounds difficult there is the added complication of The Fury. It is some strange force-field which mysteriously sucks in drivers; only one has ever returned and unfortunately [illegible] is now mute.

The graphics are very unimpressive. It was extremely difficult to read the instructions and the cars resembled a five-year-old's efforts. The sonics were of the crash-bang variety and did not really serve any purpose, as they were so weak. As for gameplay, it claims [illegible] be fast, addictive, blistering and sensational. I did not find it to be any of them. I would substitute slow, uninteresting, dull and boring – but I was never a very good driver.

Reviewer: Kelly Beswick
Price: [illegible]
Supplier: [illegible]
POPULAR RATING
Graphics: [illegible]
Sonics: [illegible]
Gameplay: [illegible]
40

Your complete guide to all the software released this week

AMIGA

Program *Buggy Boy* **Price** £24.99 **Supplier** Elite Systems Ltd, Eastern Avenue, Lichfield, Staffs WS13 6RX.

Accelerate into the action as you zoom down the track collecting flags and avoiding obstacles as you race against the clock.

AMSTRAD 6128

Program *Jinxter* **Price** £19.95 **Supplier** Rainbird Software, Wellington House, Upper St Martins Lane, London WC2H 9DL.

[illegible] is one of those days you must be playing *Jinxter*, an adventure game of luck – and remember every silver lining has a cloud.

ARCHIMEDES

Program *Missile Control* **Price** £14.95 **Supplier** Minerva Systems, [illegible] Sidwell Street, Exeter, Devon EX4 8PB.

Defend your cities from an onslaught of missiles with your three missile bases but watch – your supply of missiles is limited.

Program *Minotaur* **Price** £14.95 **Supplier** Minerva Systems, 60 Sidwell Street, Exeter, Devon EX4 8PB.

Search the mazes for the lost souls but watch because the minotaur is on the loose and looking for lunch.

CBM 64

Program *Crazy Paving* **Price** £1.99 **Supplier** Maynard International Ltd, 12 Chiltern Enterprise Centre, Station Road, Theale RG7 4AA.

Zigmund made a mistake while laying crazy paving and Howard the robot has to do the job again, which consists of laying 60 paving stones in four gardens.

continued on page 29 ▶

PIPEDREAM

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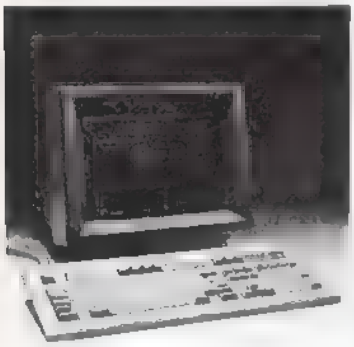
PipeDream is a step forward in integrated software.

With existing integrated packages, you have to divide your work into artificial sections, such as text, numbers and calculation, and database



With PipeDream, you compose your work in the order you want to print it, with text and numbers all together ■ one document. Incorporate calculations directly into paragraphs of text and formatted paragraphs directly into spreadsheets.

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PipeDream is a word processor offering many columns of formatted text. That film script you were going to write next holiday? Ideal.

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And being able to mix numbers and text together means you can calculate invoices and mail-shot them without resorting ■ expensive accounting software.

In fact, PipeDream's unique integration means that mail-shots couldn't be easier.

Simply type in your letter or invoice, leaving gaps for names, addresses and payment dates. Then PipeDream will print the letter to each addressee, automatically inserting all the details, and keeping the text neatly formatted and aligned.

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But don't just take our word for it. This is what Michael Bywater of *Punch* had to say:

"PipeDream itself is a remarkable achievement. It offers a spreadsheet, a word processor and a database, and if you think I am talking about a conventional integrated program, you are wrong. PipeDream does all those things within one program. No switching between modules or cutting and pasting; PipeDream simply offers you a matrix of 'slots' into which you can either type continuous text or figures or formulae or database 'fields'."

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- linking files enabling you to pass the results of calculations between spreadsheets
- special 43×80 display on EGA and 50×80 display on VGA.

This in addition to all the facilities many thousands of Z88 PipeDream users have come to expect:

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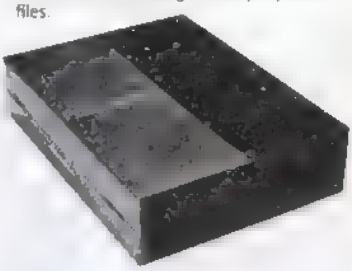

As *Punch* summed up:
"PipeDream offers as much spreadsheeting power as you can need ■ bullshit the opposition, and what's more, you can write your lies and then make up your sales projections in the same document, just by telling PipeDream that this next bit ■ numbers or text or a database or what you will."

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Stalingrad – Spectrum

In 1942 the German army met with grief as it attempted to take Stalingrad. It suffered massive casualities; 32 divisions were lost and a further 16 were severely depleted. The cause of this military disaster was a combination of bad tactics and the ferocity of the Russian defenders.

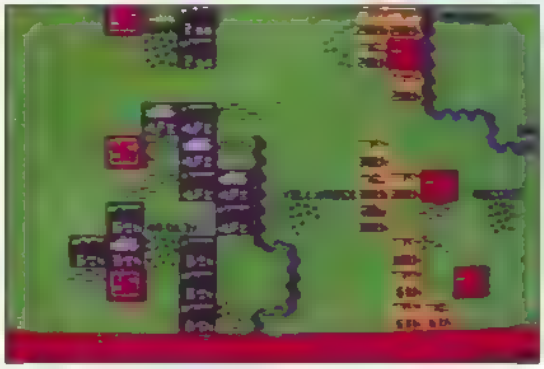
This program sets up the initial troops positions and then leaves you to decide the outcome of the battle, perhaps changing the entire course of the war.

As the controller of the German army your objective is to take and hold *Stalingrad*. To enable you to achieve the objective you have the 1st and 4th Panzer armies, 2nd, 6th, 11th and 17th armies and the Rumanian army under your control.

A system has been created to allow supplies from captured cities and troop reinforcements, giving the game an increasingly complex set of objectives which need to be met to maintain the armies under your control.

For a Spectrum game the graphics are surprisingly good, although the state of the graphics in a strategy game should make little difference to the overall game but, then again, it all helps.

No sound effects are included in the game in an attempt not to glorify war but to produce an environment in which it is possible to re-enact the battles fought in and around Stalingrad.



Reviewers
Adrian
Price
Supplier
POPULAR RATING
Graphics
Sonics
Gameplay
56

Corruption – Atari ST

I was going to start by commenting on how true to life this adventure game is but I soon realised that you might gain the wrong impression from that comment.

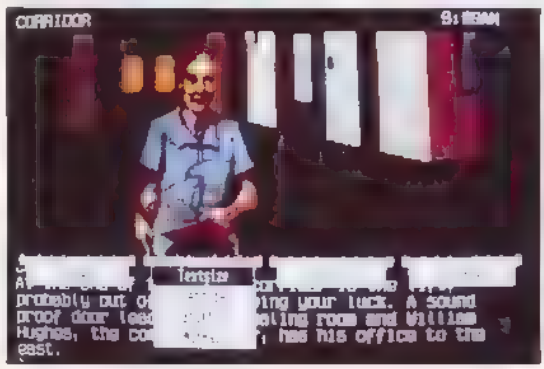
There is little point in describing a Magnetic Scrolls adventure as I am sure you are all familiar with the standard of games it produces but for all adventurers new to the area let me briefly sum up by saying its games have great graphics with puzzles which become more and more logical with each new release.

The plot to *Corruption* follows the antics of a naive businessman who has been framed by his partner. To extract yourself from this mess and stay out of jail you must gather your resources and con, bribe and blackmail your way through a host of characters to become every bit as ruthless and detestable as they are.

If your character is slow on the uptake, the game may be a little short as there are one or two slightly less than scrupulous characters in the game and their aims and your life expectancy have something in common.

This is by no means an easy adventure but one I would heartily recommend to the more hardened adventurers with a taste for a little back-stabbing.

The graphics, as with all Magnetic Scrolls adventures, are superb and the parser is good. A game well worth checking if you feel like getting a little mind-bending intrigue with great graphics.



Reviewers
Adrian Pumphrey
Price
Supplier Rainbird
POPULAR RATING
Graphics
P&O
Gameplay
75

Software guide continued

◀ continued from page 27

Program *Professional Snooker Simulator* **Price** £1.99 **Supplier** Code Masters Software Co Ltd, PO Box 8, Southam, Leamington Spa, Warks.

Enjoy a relaxing game of snooker as you play against a friend or the computer in a battle of the baize.

Program *Skegpool Rock* **Price** £1.99 **Supplier** Maynard International Ltd, 12 Chiltern Enterprise Centre, Station Road, Theale RG7 4AA.

A super computer was created to solve the problem of the war-like tendencies of mankind. The computer decided the solution was the total annihilation of the human race. Your task is to search the seaside resort of Skegpool Rock and locate the codes needed to deactivate the computer.

Program *Bad Cat* **Price** £9.99/£11.99 **Supplier** GO!, Media Holdings Ltd, Units 2-3, Holford Way, Holford, Birmingham B6 7AX.

The cat version of the Summer Olympics as the cat goes under, over and around the city performing deeds of skill and timing.

SPECTRUM

Program *The Fury* **Price** £8.99 **Supplier** Martech Games Ltd, Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE.

Hit the rim and blast your fellow competitors to oblivion as you

continued on page 30 ▶

Software guide continued

◀ continued from page 29

enter the race for which it is worth dying. In fact that is exactly what most competitors do.

Program *Rockfall* **Price** £1.99 **Supplier** Maynard International Ltd, 12 Chiltern Enterprise Centre, Station Road, Theale RG7 4AA.

Pothole madness as Richard the potholer strikes gold. Your task is to collect the gold without receiving a fatal blow on the head from a boulder.

Program *Skate Crazy* **Price** £12.99 **Supplier** Gremlin Graphics Software Ltd, Alpha House, 10 Carver Street, Sheffield S1 4FS.

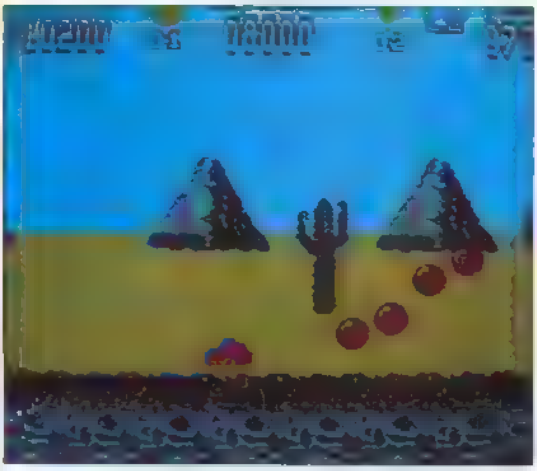
It is time to clean up your town as you don your roller skates and hit the streets showing the judges a clean pair of wheels.

Program *Bionic Commando* **Price** £8.99 **Supplier** GO!, Media Holdings Ltd, Units 2-3, Holford Way, Holford, Birmingham B6 7AX.

Leap into the action as the *Bionic Commando* flexes his arm and enter the enemy base in an attempt to neutralise the doomsday weapon.

Program *Hoppingmad* **Price** £7.99/£12.99 **Supplier** Elite Systems Ltd, Eastern Avenue, Lichfield, Staffs WS13 6RX.

Get hopping as you guide a string of spheres across the landscape avoiding sharp objects and collecting balloons.



Hoppingmad – CPC

Relax, get away from the manic actions of day-to-day life, play the game and practise those mantras as you progress sedately through the levels. I admit it is a rare game which requires the user to exhibit non-violent actions against fellow creatures.

The objective is to control a string of four balls as they bounce along the landscape, attempting to avoid the objects likely to bring their existence to grief.

To complete a level you must collect 10 balloons which can be found drifting across the screen; bounces can also be collected by making contact with apples and various other objects.

The controls consist of speed up and slow down, as well as bounce higher, which is needed to reach the elusive apples and the balloons before they drift out of range.

The game starts in a forest where you must avoid such hazards sphere-eating plants, birds and bees. On completion of the first level you move to a seaside landscape which for some reason contains rocks and cacti.

There are several pleasant features, including the sedate pace of the gameplay. The number of lives is limited to three but with four spheres in a chain you affectively have 12 lives per game.

The graphics are good but the loading screen is especially good. It is a pity the loading screens do not affect the gameplay. With competent sound effects, the game is perfect for players who prefer to rely on judgment and timing rather than lightning reflexes or vast amounts of mental agility.

Arena – CBM 64

His mind raced as he plotted and counter-plotted in a vain attempt to keep the grey wizard's forces from his person. At the other side of the arena the grey wizard rejoiced at the predicament of his opponents, unaware that the green wizard was about to annihilate them both. So begins a multi-player combat game of magic and strategy, *Arena*.

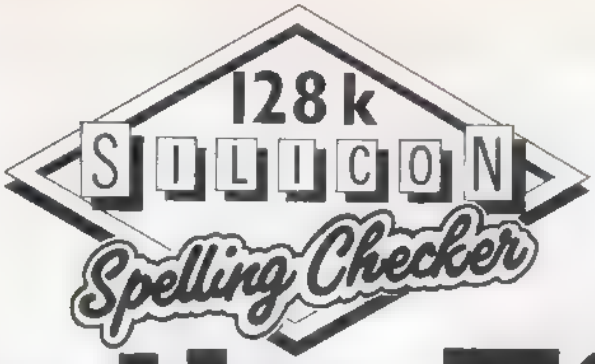
The High Mage is starting to feel his age, so he has decided to retire. His successor is to be chosen in the arena, an area of wizardry combat where only the strongest and most cunning of sorcerers will survive to inherit the coveted title of High Mage.

The arena consists of a large square area populated with grass, trees and Mirkwood forests which attack enemy players and their creations who wander too close. Also within the arena are the combatants. Up to eight players can take part, controlled either by the computer or human players, allowing co-operation and deceit to prevail which greatly enhances any game of this type.

The spells available for your player's use are selected randomly from a list of 80. The spells cover a wide range of applications, giving both defensive and offensive options. Monsters can be summoned to increase your army or the landscape can be altered to enhance your situational defences.

Each spell is aligned with good, evil or neutral and subsequent casting of spells changes the prevailing atmosphere.

The game is surprisingly good despite the less-than-perfect graphics, mainly due to the number of players allowed and the large variety of spells. The music is best turned off to allow you to concentrate on a game which could well prove to be a budget classic.



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- ☑ User dictionaries can be saved and loaded to and from file or other computers, as ASCII files.
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  - Words that have one or more letters missing (solves crosswords).
  - Words that have the correct letters, in the wrong order (solves anagrams).
- ☑ Browse through the dictionary.
- ☑ Built-in text editor. A simpler more straightforward text editor than Pipedream. This editor offers the following;
  - Fast scrolling.
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  - Insert or Overwrite modes.
  - Pipedream like deletes - back forward, word, line etc.
  - logical standard editing features, i.e. words wrap as you type, lines can be split by pressing RETURN at any point, lines may be joined by deleting back from the line start.
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  - Check word at cursor.
  - Check text from cursor onwards.

The real use of SPELLMASTER is not always in correcting spelling mistakes. Few people are expert typists, especially on a lightweight portable such as the Z88. SPELLMASTER can detect typing errors just as easily as spelling mistakes and can ensure that text entered on the Z88 is correct before it is downloaded to other computers.

SPELLMASTER is more powerful, and certainly more convenient, than many spelling checkers provided on larger micros.

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Designer writing

Emma Norman reviews a new package for the Amstrad PCW which allows you to write with style.

Many people must often have wished that there were alternatives to the standard typestyles on an Amstrad PCW, because whenever a document of any kind has been printed by a computer, whatever you may do to it, it always looks as if it has been printed by a computer. Until now that is. For Locomotive Software has introduced *Locofont*, a software package which gives you a choice of 12 fonts.

The fonts supplied on the Locofont disc are in two forms, one for use as the main typeface the other as alternatives. There is also a facility to design your own characters for each new font using Locochar, described in the *Locoscript 2* user Guide, which is useful, if you can understand it.

The main failing of Loco Software is that its manuals are decidedly difficult to understand. The Locofont manual is slightly easier than most, compared to its counterpart the *Locokey Keyboard Designer*, which has, possibly the worst set of instructions it has ever been my misfortune to read. At least with the Locofont manual Locomotive has taken steps to separate the instructions for a dual drive machine 8512 and the 8256, listing stage by stage the operating instructions under clear headings, and open with details about how to set up your disc.

The first thing to do when changing fonts is to choose which typestyle you will use most often and set it up as the main 'default' typestyle. This process is relatively fast and simple, you copy the fonts you prefer to your start-of-day disc to replace the MATRIX PRI file already there and move them into drive A. The only disadvantage to this is that, because of lack of space, there is a limit to the number of files you can input. So as the manual suggests you have either two discs, one without *Locospell*, or double the disc drive memory.

You can change the fonts available on your machine as often as you wish but another disadvantage to the package is that the settings file can store details of only 10 files at most. To add new ones you must remove the old, so you never have immediate access to 12.

The fonts available are Capital font, recommended for advertisements in shop windows; Copper Plate for invitations; Definite for guarantees; Deco for menus; Finesse for announcements; Modern for machine instructions; Script for writing letters; Roman, Sans serif and Standard one and two.

The manual advises that when printing in a new font the best results are to print at high quality, a number of them being designed for high-quality print only.

To use any of the fonts you need to set up the document specifically for that font and ensure that the font is the "current" character set when printing.

Another minor disadvantage to the package, is that there is no facility to review the font on-screen, which would be helpful.

The fonts with which I was most impressed were the script, which is joined-up writing, and Deco, is a very 1930s flowing style. Another new piece of software launched by Locomotive is the Locokey Keyboard Designer which enables users to customise keyboards with virtually any accents they wish so that, by pressing a single key, a letter will appear with the chosen accent above it. With Locokey the whole keyboard can be transformed into Arabic or Greek. Having examined that manual thoroughly I am considering waiting for a good Samaritan to publish a clarity guide to it before reviewing it. □

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In descending order:
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Just a bit of know-how

David Pavey, of Stevenage, Herts, writes:

Being the owner of a 520 STFM and also a 1MB double-sided disc drive, I read with interest the letter from Jason Boydell and your reply – June 2–8. I would be grateful if you could advise me a little, as my electronics know-how is very limited.

First, I managed to get a switch – DPDT – from Tandy and, from your drawing, the middle pins are connected to 10A1 and 10A2.

Is it satisfactory to solder a wire on to the pins of the chip and do I need to remove the chip from the board first?

Second, how can I identify these pins on the chip? Are they marked?

Next, the drawing shows two wires from the switch going to drive 0 (A) and drive 1 (B) select. Where can they be found on the computer and how can wires be connected to them?

Last, the drawing shows the two right-hand pins of the switch crossing over to the drive selects.

Am I correct in saying that these wires also go to the drive selects?

It seems that it should be an easy upgrade to do as long as you take your time and use a little common sense. I can see no problems for a novice like me undertaking such a task so long as I have full instruction.

A The first point to make is that you should not solder anything directly to the YM2149 chip or its pins. It is easy to damage an integrated circuit in this way and, in any case, it is not really the best approach. What you need to do is turn over the circuit board and see where the tracks from the two pins – 10A2 and 10A1 – go.

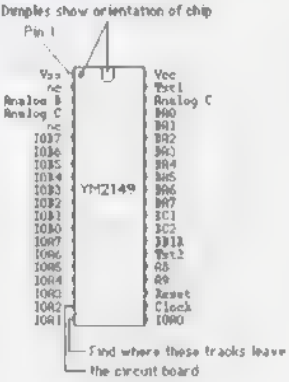
At some point they should leave the board via wires. If you look at the switch circuit again you will see that it is inserted in the wiring as it stands.

All you need to do is wire the switch, as shown, and then cut the at some point.

Integrated circuits are manufactured with a dimple at the top or by pin one – see orientation diagram – so that you can tell which is pin one, and hence find the other pins.

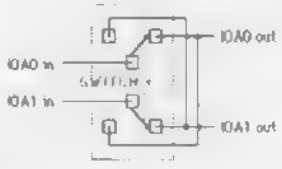
The circuit operates by crossing over the select lines when the switch is thrown, making the computer think that drive A is drive B and vice versa. You are correct in saying that the wires from the outer pins of the switch go to the drive select as well – see diagram of switch.

With a little care and patience you should be able to perform this modification easily. The only problem is that if your machine is still under guarantee, tampering with its innards will invalidate that guarantee.



YM2149 chip orientation

Switch circuit inserted in select lines allows crossover.



How the switch works.

A drive select and connect one side of the switch into the gap and then the same for the B select, using the other side of the switch.

If you trace the tracks carefully you should have no difficulty inserting the switch. I would suggest that the drive B select – external – goes to the external drive socket and should be easy to find.

The internal drive may be a little more difficult but there should be a wire which can be cut

Long in the tooth

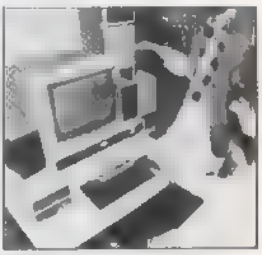
Iain Michelle, of Great Sutton, Cheshire, writes:

I have a BBC model B and although it is getting a bit long in the tooth I still think it is a good machine and would like to link it to my ST. I know all the connections and am ready to make an RS232 cable. I would like to know how long can the cable be? If I make it too long, will I have transmission problems?

A The BBC B serial port is specified to be RS423 and as such is theoretically capable of sending data over long distances.

So far as I can remember the limit is about 1,000ft, more than sufficient for most applications. Any problems you have will generally be due to using high speeds.

As with most data transmission systems, the longer the cable the more it rounds off the edges of the signals. At higher speeds that becomes more pronounced. So the best thing to do is to hook them and start with the highest speed and then reduce it until transmission is reliable.



The BBC B

Double-sided use

Peter Baker, of Wimbledon, London, writes:

I am considering buying an extra disc drive for my Atari 520STFM. I wonder if you could tell me how much I can store on a double-sided 1MB drive? I know that it is rated at 720K but how much of this is usable?

A After formatting a double-sided disc on the ST 1MB drive you get 726,016 bytes available for storage. This is somewhat less than the reputed 1,048,576 bytes a true 1MB drive would have but it is better than the 357,378 bytes of the single-sided system.

Blank set

Gillian Harris, of Hackney, London, writes:

Q In the June 2–8 issue you mentioned a 'good book' on the subject of the Mandelbrot set. I would like to display some of the pictures on my ST but I cannot work out how to do it. Could you give me an example program?

A The trick is to follow the instructions in the appendix – do it yourself. The program shown should give you a starting point on how it is done. The main problem with displaying the set on the ST is that there are only 16 colours. To get more detail, the number of colours cmax% is set to 1023 and the colours are cycled through with c%=k% mod 16. You can also do it in black and white with mod 2. The program was written in HiSoft Compiled Basic but it should be easy to convert it to any other Basic of the Microsoft type – or any other for that matter. The only disadvantage is that it is rather slow. The picture in the example takes more than an hour to draw. For this reason it is best to save it as soon as it is drawn. If you have *NeoChrome*, create a blank picture – called PICTURE.NEO – from within it and then run the program. The bload loads the blank picture into memory, draws the Mandelbrot and then saves it as the program finishes it. The file MANDEL.NEO can then be loaded into NeoChrome and the colours changed for the best effect.

```
'Set up an attractive
colour palette
palette 0,0
palette 1,&H100
palette 2,&H200
palette 3,&H300
palette 4,&H400
palette 5,&H500
palette 6,&H600
palette 7,&H700
palette 8,&H701
palette 9,&H702
palette 10,&H703
palette 11,&H704
palette 12,&H705
palette 13,&H706
palette 14,&H707
palette 15,&H607
LIBRARY "xbios"
WINDOW fullw
WINDOW  OFF
'Get screen start address
pic=FNlogbase&
'Load a NeoChrome blank screen
bload "PICTURE.NEO",pic-128
CLS
'And off we go
'a% is the horizontal size of the screen,
b% is the vertical
a%=200
b%=200
pmin=-2.25
pmax=.75
qmin=-1.5
qmax=1.5
m%=200
cmax%=1023
dp=(pmax-pmin)/(a%-1)
dq=(qmax-qmin)/(b%-1)
FOR np%=0 TO a%-1
FOR nq%=0 TO b%-1
p=pmin+np%*dp
q=qmin+nq%*dq
k%=0
x=0
y=0
dloop:
xn=(x*x)-(y*y)+p
yn=(2*x*y)+q
k%=k%+1
x=xn
y=yn
r=(x*x)+(y*y)
IF r>m% THEN c%=k% MOD 16:GOTO dplot
IF k%=cmax% THEN c%=0:GOTO dplot
GOTO dloop
dplot:
PSET (np%,nq%),c%
NEXT
NEXT
bsave "MANDEL.NEO",pic-128,32128
```

Ramming away

E Bruce, of Southend, writes:

Q Since the disc drives on the ST are so slow I have taken to using a RAM disc when programming.

The only trouble I have found is that when I re-set the machine with the little switch at the rear, the RAM disc does not seem to go away properly. It has gone from the desk-top but, when I try to re-initialise it the program assigns the next drive letter. If the RAM disc was drive D, after a re-set the program assigns drive E.

I also run out of memory after a few re-sets. What can I do about this? Is it a problem with the RAM disc program or the ST?

A It is a problem with both the ST and the RAM disc program. Re-setting the ST causes a warm boot and, although the drive may not appear on the desk-top, unless saved, so far as the GEM is concerned there is a section of memory still set aside for it.

The problem with the program is that is should de-allocate any previous memory set aside for the RAM disc when the re-set switch is pressed and then re-allocate it when asked.

The trouble is that it does not seem to be doing this. The easy answer is to switch off the ST for about 10 seconds to get it to cold boot. An alternative is to get a more advanced RAM disc program.

Hot headed

Alan Sangster, of Ruplon, Lancashire, writes:

Q I have been using my ST 1040 a great deal in the last few weeks and have noticed that it becomes hot at the top left-hand side of the case. Is it satisfactory to leave it on for long periods over-night or will it over-heat?

A You should have no trouble so long as you do not block off any ventilation.

Do not leave books or pieces of paper on top of the machine. Make sure that the surface on which you stand it is hard and flat, i.e., a desk-top.

I leave my ST on for days, without problems so far. For all that it becomes a little warm but I do not think that is anything to worry about.

Write Protect - C64

Alex Jones

This small program for the Commodore 64 with 1541 or compatible disc drive will disable all "write" commands except for the "ID Format". □

```
10 REM WRITE PROTECT (C) 1988 ALEX JONES
20 OPEN15,8,15,"I":OPEN8,8,8,"#"
30 PRINT#15,"U1,8,0,18,0"
40 PRINT#15,"B-P:8,0"
50 FOR A=0TO143
60 PRINT#8,CHR$(0);
70 NEXT
80 PRINT#15,"U2,8,■,18,0"
90 CLOSE15:CLOSE8
```

Boot up - ST

Gareth Pople

Here is a short listing for the Atari ST using GFA Basic. The program performs a useful function many ST owners have been seeking - the ability to boot from any drive.

Most desk accessories and programs in AUTO folders work although not all are compatible. Desk accessories which load resources files will not work as they search for those of drive A. □

```
Print "Boot drive switcher."
Print "Gareth Pople 17/5/88"
Print
Print "System boot device number."
Print "0=A 1=B 2=C etc.";
Input Boot%
Sdpoke &H446,Boot%
' POKEing priviledged word
' at 446 hex, 1094 decimal
Print
Print "Press space for desktop,"
Print "or reset to boot."
Repeat
Until Inkey$=" "
Cls
```

Datestamp - ST

Paul Morley

Datestamp is a simple date and time-setting program designed to be resident in an AUTO folder, so that the time and date can be set on power-up.

The program has been written in HiSoft Power Basic. Once the program has loaded, follow the on-screen prompts to set the time and date. □

```
'DateStamp                    by P.Morley 1988

LIBRARY "XBIOS":IF FNgetrez%=0 THEN SCREEN 1:WIDTH 80
PALETTE 0,0:PALETTE 1,&H777

DO
 LOCATE 1,1
 PRINT "THE TIME IS    ";TIME$:PRINT "THE DATE IS    ";DATE$
 LOCATE 8,6:PRINT "ARE THESE SETTINGS CORRECT (Y/N)"
 a$=INKEY$
 IF a$="n" THEN GOSUB set:CLS
LOOP UNTIL MID$(a$,1)="y"
STOP -1

set:
CLS
PRINT "REMEMBER! TIME IS IN 24 HOUR CLOCK FORMAT":PRINT
LOCATE 6,4:INPUT "ENTER CURRENT TIME (eg 14:12:12)    ";h$:TIME$=h$
LOCATE 7,4:INPUT "ENTER TODAYS  DATE (eg 04/22/1988) ";d$:DATE$=d$
RETURN
```

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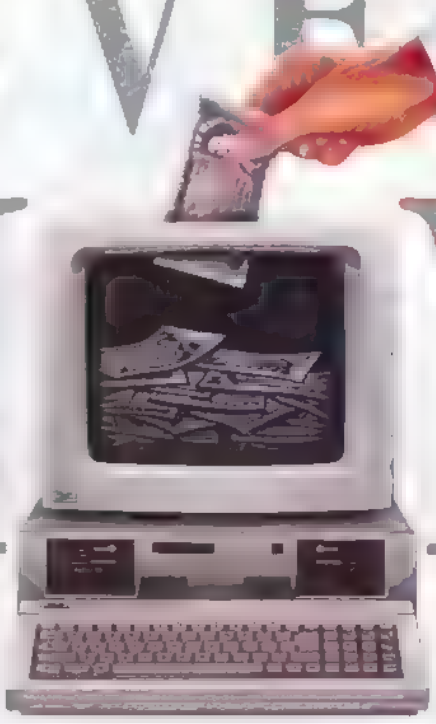

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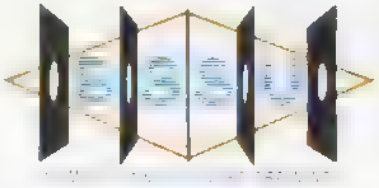

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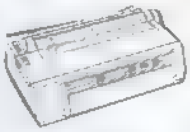

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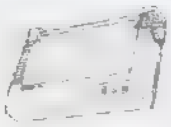

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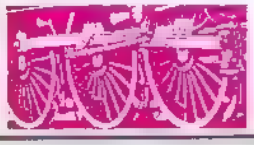

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Learning Computing the Logo Way

I was in Canterbury when someone who heard that I dabbled occasionally in Logo asked me whether I thought the language lived up to all the claims of its inventor, Seymour Papert. I replied that while it probably had not made the great advancement in mathematical learning often ascribed to it, it had succeeded admirably in introducing a generation of young people to computers in a simple and amusing way. In the U.S. especially, the idea of letting people learn by making a robot turtle drive all over the floor has been more widely accepted than in the U.K.

In this respect Logo has succeeded far better than if it had produced millions of mathematical genii.

Getting people to use a computer without fear is one of the most difficult tasks in teaching about the machines. The younger generation feels at home with them, having been brought up with them in one form or another.

The next generation will be even more at home with them, since almost every electronic device will have a computer of some kind in them.

There are still a large number of people who are afraid to touch a computer. The fear is an irrational one - that they will somehow break the machine, or it will 'bite' them - and yet it remains.

The usual arguments about the machines being completely safe and already running many areas of their life do nothing to convince them.

One way is through fun. A game, whether of *Space Invaders* or a more peaceful adventure, may not be the best use for a computer but it is fun and can take away the fear of a computer. Another such introduction is Logo.

This language can provide a good introduction, especially when connected to a floor turtle.

In Britain its use seems to have been somewhat hampered by the widespread use of Basic in home computers, together with the lack of external control facilities in the cheaper models and the expense of the turtles.

In general, people with home computers preferred to use the five minutes a program took to load from cassette to load a game rather than a language.

The latest generation of micros could change all of that.

Their disc drives allow programs to be loaded and tried quickly, while the high-quality graphics available render a turtle unnecessary and less fun than an onscreen version.

With these machines being established in schools and homes, Logo could have a new chance to introduce people to the fun of computers.

The advantage of the language over a game is that, once the initial fun has been overcome, it provides a basic grounding in the techniques used in all forms of programming. To get the turtle to draw a particular shape it is necessary to plan what needs to be done, determine how to do it, and finally write and enter a program to do it.

This, in essence, is what programming is about and the techniques learned with Logo will stand users in good stead whatever they then do in computing - or any other walk of life. In addition, a full implementation of the language allows experiment beyond turtle graphics and into the world of list processing.

Perhaps Logo has not lived up to the claims of its inventor but it has succeeded, and will continue to succeed, in a far wider and more important area. Long may it prosper. □

Robert Halliday

HACKERS

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